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**THE INFORMATIONAL CONTENT OF FINANCIAL INFORMATION
ON THE INTERNET**

A Dissertation

SUBMITTED TO THE GRADUATE FACULTY

in partial fulfillment of the requirements for the

degree of

Doctor of Philosophy

By

**Michaël Dewally
Norman, Oklahoma
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THE INFORMATIONAL CONTENT OF FINANCIAL INFORMATION
ON THE INTERNET

A Dissertation APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

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TABLE OF CONTENTS

Chapter 1 Introduction	1
Chapter 2 Essay 1: Internet Investment Advice: Investing with a Rock of Salt.	
2.1 – Introduction	6
2.2 – Literature Background	8
2.3 – Data and Methodology	
2.3.1 – Data Selection, Collection Process and Firm Characteristics	9
2.3.2 – Methodology	13
2.4 – Origin and Value of Internet Recommendations	
2.4.1 – Reasons for the Recommendations	14
2.4.2 – Market Impact and Informational Value of the Recommendations	
2.4.2.1. – Market Impact	16
2.4.2.2. – Informational Value	16
2.5 – Posters’ Activity Influence	18
2.6 – Multivariate Analysis	19
2.7 – Conclusion	21
Chapter 3 Essay 2: The Informational Value of Earnings Whispers	
3.1 – Introduction	23
3.2 – Theoretical Background	25
3.3 – Data	
3.3.1 – Sources of Whispers	26
3.3.2 – The Sample	28
3.4 – Whisper Accuracy	29
3.5 – Do Whisper Impact Stock Prices?	34
3.6 – The Trading Value of Whispers	38
3.7 – Conclusion	40
Chapter 4 Essay 3: Certification versus Reputation: A Comparison using eBay’s Comic Book Auctions	
4.1 – Introduction	42
4.2 – Comic Book Marketplace	
4.2.1 – Overview of the Comic Book Collecting Marketplace	43
4.2.2 – Certification in the Comic Book Marketplace	44
4.3 – On-line Auctions Structure and Research, Information Asymmetry Research and Hypotheses	
4.3.1 – Description of eBay Auctions	47
4.3.2 – On-line Auctions Research	48
4.3.3 – Information Asymmetry Research	49
4.3.4 – Hypotheses	51
4.4 – Sample	
4.4.1 – Sample Construction	53
4.4.2 – Variables Definition	54

4.4.3 – Sample Description	55
4.5 – Results	
4.5.1 – Univariate Analysis	56
4.5.2 – Multivariate Analysis	59
4.5.3 – Tobit Analysis	62
4.6 – Certification Decision and Price Guide Accuracy	
4.6.1 – Certification Decision	64
4.6.2. – Price Guide Accuracy	67
4.7 – Conclusion	70
References	72
Appendices 3.1-3.2	78-80
Figures 2.1-4.5	81-87
Tables 2.1-4.14	88-117

CHAPTER 1

Introduction

In the past decade, the Internet has transformed financial markets. There appear to be two primary dimensions to this transformation. First, replacing traditional middlemen, it has allowed more direct participation of individuals in financial markets. Recent reports estimate there are over 12 million on-line brokerage accounts. In conjunction with this move to on-line trading, individual investors have reduced their interaction with traditional brokers. Second, the Internet offers investors a bonanza of corporate, financial and economic information. Investors can access news, reports and analyses on multitude of financial and information advice websites. Investors can also interact with each other discussing in chat rooms, leaving comments on message boards, subscribing to email lists and participating in newsgroups. This second aspect, the tremendous expansion in information sources available to the investor, is the subject of this dissertation.

In the following three essays, I try to find new and innovative ways to answer the question: Can individual investors derive value from the information freely provided on the Internet? I contribute to the literature by focusing my efforts on three aspects of the on-line revolution and I provide answers to the recurring question about informational value on the Internet. While some studies have investigated the decision to switch to the new medium and the changes in behavior occurring after the move is completed, few have investigated the returns accruing to an individual investor from this new strategy. The principal reasons are a lack of databases recording investors' actions and a confounding plethora of possible information sources to examine.

In the first essay, I investigate the origin and the quality of investment advice on the Internet. In particular, I collect and categorize the stock recommendations distributed in

major newsgroups. From the discussion in these forums, I develop a database of stock recommendations on a daily basis for two time periods. The first time period occurred during the height of the last bull market whereas the second time period spans a period during which stock prices were heavily beaten down. These differences in context allow me to abstract from market conditions and to reveal the intrinsic quality of the recommendations. I also answer the question that has posed concern to regulators: is there a market reaction to the advice?

First, with regard the nature of the recommendations, I find that Internet stock recommendations are overwhelmingly positive. The buy-sell advice ratios in excess of 7 to 1 disavow the idea that short sellers use this medium to spread negative rumors. Moreover most advisors on the Internet follow a momentum strategy -- they recommend stocks after they have experienced sharp price increases. Second, the stock market does not appear to react to Internet newsgroup recommendations. The two-day cumulative abnormal returns are mostly insignificant, regardless of the recommendation characteristics. Third, the longer horizon returns fail to be significantly above the market's corresponding performance. The recommendations have no informational value.

In summary, there is no evidence that any new worthwhile information is exchanged in these forums. However, there is also no evidence that investors in general pay much attention or attach much importance to these recommendations. Overall, the fears raised by the media about the destabilizing power of such traders that participate in these discussions can be mollified.

The second essay examines the significance of unofficial earnings estimates, or "whispers", circulated on the Internet. These unofficial forecasts have captured the attention of the investment community and of the financial media. They have heightened the drama of companies' earnings releases and have been played up as explanations for stock prices'

reactions to actual earnings announcements. I examine three aspects of these forecasts. First, I examine if their accuracy is comparable to that of official analysts' consensus, previously the best estimates to future earnings available to market participants. Second, I check if the general assertion that whispers are driving forces in stock prices' reaction to earnings announcements is true. Finally, based on their predictive performance, I investigate the potential informational value contained in the whispers. Again, I gather my sample from a well-known on-line source of whisper information. Then, I compare whispers' performance to that of traditional investment analysts.

In answer to my first question, I find that whispers, while unbiased, are not more accurate than the analysts' consensus. Also, I find mixed evidence that the market partially impounds whispers' information into price. Finally, since the analysts' forecast remains the better indicator of actual earnings, betting against the whispers' advice, by shorting stocks that whispers predict will outperform the corresponding analysts' consensus, becomes a profitable strategy.

In summary, whispers are not as accurate as represented. They are only a fair predictor of stock prices' movement and do not represent the market's true earnings expectations. They do not provide any unique information beyond that of analysts' forecasts.

The third essay attempts to discern the relative effectiveness of different strategies to reduce information asymmetry. In the on-line comic book market where book condition largely determines price, sellers must authenticate their products' quality much as a company must when selling bonds or issuing its initial public offering. This market is particularly pervasive to the investigation because detailed transactional data is easily available from auction results on eBay and the market is sufficiently active to generate a sizeable sample. In this market, prices vary greatly dependent on the quality of the item for sale. To convey this information, sellers usually provide a scanned image of the book in the auction listing;

however there is much that can remain hidden in the picture. Therefore sellers commonly rely on three discriminating mechanisms to convey book quality.

First, an established seller can rely on its reputational stock to entice bidding and to raise confidence in the quality grade they personally assign to their inventory. EBay has been commended in the customer-to-customer industry for its introduction of the Feedback Rating system that provides a clear measure of community members' reputation. Second, in the absence of reputation, sellers can turn to an independent grading service provider. In January 2000, a third party grading company started providing a neutral, full-disclosure grading service for the comic book market. Auctions of certified books on eBay have risen dramatically over the last year reflecting the credibility ascribed to this service. I ascertain the value and cost-effectiveness of the certification process. Finally, comic book sellers can offer warranties to their customers. They frequently offer refund terms, such as a 10-day free full money-back warranty, to let the buyer inspect the book they had to purchase sight-unseen over the Internet. Payments via credit card also provide an implied warranty.

Overall, the on-line comic book market is a perfect laboratory to investigate the relative impact of various avenues alleviating information asymmetry. The market presents independently certified comics by a credible third party alongside non-certified copies, provides a clear measure of reputational stock, and has low fixed cost warranties.

I show that of the three mechanisms certification is the most valuable to sellers, generating a significant premium in price. The other two techniques have smaller impacts and prove poor substitute for certification. I also show that these techniques work in conjunction with each other and have additive properties. Finally, I ascertain the value and cost-effectiveness of the certification process and show that the comic book marketplace can rely on an accurate Price Guide.

In summary, my results indicate there appears to be little new informational value available in the on-line financial information investigated in the following essays. While the Internet has a real impact on market efficiency via the transactional and informational costs efficiency it generates, the quality and extent of the information that is circulated is not superior to otherwise publicly available information.

CHAPTER 2

Essay 1: Internet Investment Advice: Investing with a Rock of Salt.

2.1 - Introduction:

The explosion of Internet usage has opened direct access to financial markets for millions of individual investors. In 1999, International Data Corp. tallied over 6.4 million on-line brokerage accounts. The power and ability of these individuals to affect stock prices is impressive. As Kenneth Pasternak, chief executive of Knight/Trimark Group, tells Bloomberg: "Their [individuals placing trades with the click of a computer mouse] aggregate buying power is unprecedented...So many traders with very short-term horizons have made the market a lot more Nintendo-ish." This massive number of individuals has become knowledgeable and addicted to the stock market to a greater extent than ever before. To satiate their appetite for stock market news, trends and rumors, numerous online resources organized. Stock market "junkies" can find information by browsing websites, joining chat rooms, downloading newsgroups or subscribing to mailing lists.

This paper investigates the quality and the origin of the advice one can obtain on such electronic forums analyzing the information on two popular Internet newsgroups. I ask: 1) what drives advisors in their stock picking process, i.e., what is the basis of the recommendation, 2) does the market respond to these Internet recommendations and 3) do the postings have informational value, i.e., what is the subsequent performance of the recommended stocks.

I find that most Internet stock recommendations are positive (66%) and many are neutral (29%) while only a few are negative (5%). While it is often alleged that short sellers use this medium to spread negative rumors driving down prices of stocks they have sold short, I find little evidence of this. On the contrary, I find a behavior similar to that of brokerage and investment banking firms that issue many more "buy" recommendations than

"sell". While the predilection toward positive recommendation by brokerage firms has generally been attributed to a supposed moral hazard, the same "buy-sell" pattern arises here in the absence of the same incentives.

One result that stands out is that the bulk of these self-styled stock analysts pursue a momentum strategy. In other words, they tout stocks that have recently done very well. The mean abnormal return over the 20 days preceding a positive recommendation is significantly greater than zero in both an up and a down market. This result is robust across exchanges, stock types, and poster characteristics and holds regardless of the benchmark used to define abnormal returns.

In general, the stock market does not appear to react to Internet newsgroup recommendations and they do not appear to have much informational value. The abnormal stock return over the two days following a positive recommendation is insignificant as is the abnormal return over the next 20 days, ranging from 0.44% to 2.50%. This result holds regardless of the stock type, the reason given for the recommendation, the exchange, whether the person posting the recommendation makes many or few recommendations, and whether the replies to the initial posting were in agreement or not.

While Internet stock recommendations appear to have little informational value, posters possess some stock picking skills. Once matched against stocks of similar pre-posting performance, recommended stocks significantly outperform their peers after recommendation.

Overall, my results vindicate Securities and Exchange Commission (SEC) Chairman Arthur Levitt. The Wall Street Journal on Friday, May 7, 1999 quoted him saying: "I encourage investors to take what they see over chat rooms not with a grain of salt but with a rock of salt." As the Report of Proceedings of the Technology Roundtable of the SEC quotes Barbara Perrier-Dreyer of OutReach Technology saying: "On the Internet any firm can look

enormous, research can sound credible, individuals can seem qualified, all without any real foundation.”

The next section reviews the literature and Section 2.3 discusses the data and the methodology. Section 2.4 reports the results at the aggregate level whereas Section 2.5 presents conditional analyses. In Section 2.6, I perform a multivariate analysis while Section 2.7 concludes.

2.2 – Literature Background:

Whereas there is a growing body of literature about the quality of investment advice (Desai and Jain (1995), Womack (1996), Metrick (1999) among others), very few studies address the phenomenon of on-line investment advice and trading. Among the few that do, Bagnoli, Beneish and Watts (1999) compare First Call analyst forecasts of earnings to the unofficial forecasts widely circulated on the Internet commonly referred to as whispers. The whispers proved to be more accurate than the consensus reported by First Call. Contending these results, Dewally (2001) finds that recent whispers are no more accurate than analysts’ forecasts and that they do not provide any unique information.

Barber and Odean (1999b) address changes in the trading patterns of investors once they switch to online trading finding that online investors “trade more actively, more speculatively and less profitably than before.”

Wysocki (1999) concentrates on the determinants of the volume of postings on the various Yahoo! message boards, finding that high short-seller activity, high market valuations relative to fundamentals, low institutional holdings, high trading volume, extreme performance and high analyst following lead to higher activity on these message boards. While providing insight on the reasons for traffic through these chat-rooms, he does not provide information as to the quality of the information exchanged in the messages. Tumarkin and Whitelaw (2001) report similarly that high trading volume, large number of

postings and an increasingly positive opinion about a stock all lead to higher bulletin board activity. However, they also show that high returns do not lead to more postings and that, for stocks in the Internet Service sector, message board activity does not predict industry-adjusted returns nor abnormal trading volume.

In this paper, I complement the current literature first by providing an analysis of the performance of stocks from all industry groups recommended on the Internet. Second, I am able document the reasons leading to the recommendations. This knowledge is relevant for the financial industry and for regulatory agencies such as the SEC that set up a special Office of Internet Enforcement¹.

2.3 - Data and Methodology:

2.3.1 - Data Selection, Collection Process and Firm Characteristics:

There are several sources of online investment advice: newsgroups, websites, mailing lists and chat rooms. I focus on newsgroups because of their accessibility and popularity. Specifically, I examine the performance of stocks recommended on two newsgroups: “misc.invest.stocks” and “alt.invest.penny-stocks”. Searching for appropriate forums, I found these two newsgroups to be the most common. They are the least specialized, allowing discussion of a wide range of equity instruments. As compared to newsgroups, individual websites are too numerous, fragmented and might not be updated at an appropriate pace whereby we would lose the opportunity to analyze day-to-day changes in recommendation. To access mailing lists, individuals have to subscribe. Generally, the subscription is free; however, some investment “gurus” charge for this service as they would for a newsletter.

In deciding between newsgroups and message boards, I considered several factors. First, it would be hard to decide which message boards to concentrate on. Yahoo! has

¹ For more on the activities of this branch of the SEC, visit its public relation web page at: <http://www.sec.gov/divisions/enforce.shtml>.

separate boards for a large number of stocks - in excess of 3,000 according to Wysocki (1999). Individuals restrict themselves to discussion on one particular stock on each of these message boards, rendering the number of contemporaneous recommendations exhibitively. Conversely, the freedom of topic on newsgroups allows for any stock to be touted as the next hot issue. Individual newsgroup posters provide the group with their recommendations. They have possibly "surfed" the web in search of information about the particular company and then come to the newsgroup community to discuss their find. This provides a less biased and cleaner way to identify what issue is "hot" than would be possible on segmented board discussions. Second, for message boards, it is difficult to determine the time of the initial recommendation rendering an event study more arbitrary. Moreover, newsgroups are as easily accessible since with most web browsers you are only a click away from downloading today's postings.

To create the data set, I access these newsgroups' archives through the Deja-News database (now under Google's ownership) at www.deja.com, for messages posted from April 1, 1999 to April 30, 1999² and from February 1, 2001 to February 28, 2001. I chose these two months because they allow for the comparison of the recommendations' performance in two different market moods. In April 1999, the market was exuberant with many companies recording high returns. The S&P 500 and the Nasdaq both finished the month up about 3.5%. I call this the up market. At the opposite end, February 2001 is the down market during which many companies warned about their earnings. The S&P 500 lost 9.2% while the Nasdaq retreated 22.4%. These two scenarios allow me to compare and contrast the performance of on-line recommendations in the face of divergent market conditions.

² The archives do not contain any record of the postings on April 25.

The archive provides not only each message but also its relationship to others in the forum. I am able to determine if the message was originating a thread³ or if it was a reply to an earlier message. The archive explored consists of a total of 33,355 postings from both newsgroups. For a message to be included in my sample, it must start a new thread⁴. This is what I coin an original message or posting. For each original posting, I record the following information: date, company profiled, recommendation, reason and author. I classify the recommendations in three groups: positive, neutral and negative. For each original message, I also collect the additional information contained in the thread: number of messages and nature of subsequent recommendations. Whereas some messages invite no further comment, some generate as many as 23 replies. Once I condition on the original postings actually prompting replies, the average is 3 replies in the thread.

I apply two screens to the data to form the final sample. To focus on the informational value of the postings, I exclude from the final sample any companies with a news release in the seven days before the posting date. I opted for the Yahoo! stock news in deciding on a source of releases. Yahoo! Finance provides free relay of several newswire services including PR Newswire, Business Wire, Standard & Poor's, EDGAR Online and CBS MarketWatch. My experience in reading messages indicates that posters rely commonly on this service to flag important company news. If a stock generates almost continuous recommendations, it is impossible to match a possible market reaction to a specific recommendation hence in a second screen I discard stocks that are repeatedly profiled. In the

³ A thread consists of all messages posted on the list in reply to an initiating message. The archive also displays the relationship of these subsequent messages with each other, i.e., replies to the original or reply to a reply.

⁴ The person posting the first message in a new thread determines the name of the thread, i.e., a heading providing insight as to what the message and thread's replies discuss. If, in the course of discussion, mention is made of another stock being an appropriate "buy", the casual reader or person not following this particular thread would have no indication of this mention. Hence, the messages starting a thread are more prominent and are clearly tagged.

final sample, I only keep stocks that have not been recommended previously for at least three days^{5,6}.

After these two screens, the final data set consists of 798 (308⁷) postings originating from 329 (109) different individuals in the up (down) market. Most recommended companies are listed on the Nasdaq or ASE markets (40%) and the over-the-counter (OTC BB) market (35%). NYSE listed and Canadian companies form the rest of the sample. These companies primarily focus on technology as Table 2.1 shows. The 3000 or 7000 SIC classification represent about 55% of the sample firms. A majority of firms in the sample are Internet players or are telecommunication-oriented entities. Nonetheless, within the 7000 category, there is a shift away from technological stocks to more traditional retailers exchanged on the NYSE during the down market.

In Table 2.2, I report statistics of the Total Assets, Current Market Capitalization, Book Value per Share, Price to Book Ratio, Number of Shares Outstanding and Financial Leverage of recommended companies. The median Total Assets are \$95 million during the up market and a higher \$288 million during the down market reflecting the higher percentage of NYSE firms in the latter. However, the means are comparable with about \$3.5 billion in assets in both periods. The median (mean) Price to Book Ratio is 3.63 (9.21) in the up market and 1.91 (3.64) in the down market indicative of both a shift in recommended companies' characteristics and a decrease in market valuations. The high up market ratio is not surprising as technological stocks whose growth potential is greater than the average firm dominate the sample. Overall, the recommended firms have characteristics similar to those uncovered by Barber and Odean (1999a) for stocks traded in a comparable time period by

⁵ For example, a stock recommended on Wednesday, April 14 will be discarded if any recommendation for the same company has been posted between Friday, April 9 and Tuesday, April 13. The information will however be included in the thread information of the previous message.

⁶ I duplicate the study with different screens. The alternate screening specification was: the first screen eliminates postings with news release within the seven days before and after the posting date and the

individuals holding accounts at a national discount brokerage house; namely, they are high-beta, small, growth stocks.

2.3.2 - Methodology:

Two objectives of the paper are 1) to document the impact and the value of the advice and 2) to identify the reasons behind the recommendations. For the former, I focus on daily returns following and preceding the posting of a recommendation. I use a simplified event study methodology, computing the market adjusted returns of these stocks for a window extending from 20 days prior to 20 days beyond the posting date of the recommendation. For U.S. and Canadian stocks, respectively, the main benchmarks used for comparison are the returns on the S&P 500 and the TSE 300. I compute abnormal returns (ARs) as the difference between the stock's log-return and the benchmark's log-return as:

$$AR = R_{\text{Stock}} - R_{\text{Benchmark}}$$

To reinforce the validity of the results presented below, I perform several robustness checks. First, restricting the sample to technological stocks, I use the Nasdaq Computer Index (IXK) as the performance benchmark to account for any potential effect driven by technological stocks performance. Second, I use multiple benchmarks for performance across exchanges: Nasdaq Composite Index for Nasdaq firms, S&P 500 for NYSE firms, Russell 3000 for OTC BB firms and TSE 300 for Canadian firms. The tenor of all the results⁷ is unchanged: the analyses are robust to the use of different performance benchmarks.

second screen retains only stocks that are recommended once within a seven-day period. The results are not altered in any material way.

2.4 – Origin and Value of Internet Recommendations:

2.4.1 - Reasons for the Recommendations:

First, I examine the recommendations and the reasoning behind them. Reading the recommendations, I characterize each as positive, neutral or negative. Of all recommendations in the final sample, 63.4% (74.4%) in the up (down) market are positive, 34.5% (14.6%) neutral and 2.1% (11%) are negative. The increase in sell recommendations is not surprising in the down market. Overall, this evidence is contrary to Wysocki's (1999) expectation that short-sellers would be very active in these electronic forums. While apparently perfect venues for short-sellers to spread negative views, the newsgroups register marginally little of such activity. On the contrary, positive recommendations dominate negative by ratios of 30-to-1 and 7-to-1 in the up and down sample, respectively.

This predominance of positive recommendations is reminiscent of the literature on analysts' behavior. Womack (1996) reports that sell recommendations are less frequent, more predictive, more visible and more costly than buy recommendations. This scarcity of sell recommendations has been attributed to costs, as reported by Pratt (1993), including harm to the investment bank's relationships with firms and potential reduction in information flow to the brokerage house. Womack reports a buy-sell ratio of 7 to 1 while Pratt (1993) estimates a ratio of 15 to 1 for strong buy-strong sell recommendations. To differentiate the effect of agency costs in the industry, Carleton, Chen and Steiner (1998) examine this ratio for brokerage versus non-brokerage firms. National (regional) brokerage houses have a buy-sell ratio of 17 (23) to 1 while non-brokerage firms have a ratio of 4 to 1. Overall, the newsgroup community behaves like the investment community without the excuse of agency costs to drive their imbalance of buy-sell recommendations. Contrary to Wysocki's supposition, unscrupulous individuals, instead of following a short-seller strategy, may practice what is

⁷ While these results are not reported since their tenor is unchanged, they are available on request.

dubbed the "pump'n dump" strategy: touting a low float stock after buying it cheap for a short-term reward.

Beyond categorizing the recommendation as positive, neutral or negative, I record the reason prompting recommendation⁸, separating the reasons into five broad categories: Changes in Corporate Structure, Operations, Financials, Market and Others. While "Operations" refers to operational aspects of the activities of the firm, "Financials" refers to the accounting measures of performance. The "Market" category groups price and volume driven recommendations. The residual category, "Others", gathers postings asking for help from other members and recommendations with no justification. As shown in Table 2.3, I divide each broad category further in more precise posting reasons.

"Others" is the most frequent category with a total of 373 (34%) postings, including 140 (13%) that ask for additional information. The second most common category is "Market" with 26% of the postings. Of these, "Price Upswings" was the most common reason (13%). Operational developments, "Operations", accounts for 22% of the postings, led by 77 postings extolling prospects of the firms' particular industry. "Financials" tally 13% of the postings. Finally, "Changes in Corporate Structure" prompts the remaining 5% of the postings. The pattern is similar in both market types with the exception that, in the down market, more postings fall in the "Other" category.

Assuming we face an unsophisticated investor population, it is striking that postings find their origin in such a variety of reasons. Absent "Other", the propensity of market variables to influence a stock pick is equal to that of operational reasons. Discussion participants combine market behavior with company's activities and innovation in deciding their next portfolio addition. A close third, the posters rely on the accounting variables used

⁸ In case a posting cites several reasons for the recommendation, I rely on the title of the message to discriminate which aspect is most relevant to the poster. If the title is uninformative, I rely on the first argument presented in the message.

by professionals. Some posters look at fundamentals whereas others are technical traders. Next, I test if they are effective.

2.4.2 - Market Impact and Informational Value of the Recommendations:

2.4.2.1 - Market Impact:

Table 2.4 presents abnormal returns (ARs) and cumulative abnormal returns (CARs) following positive, neutral and negative recommendations. There is no evidence the postings induce a reaction in the stock prices. With the single exception of positive recommendations in the down market, CARs over the two-day window (1,2) are all insignificant and this single exception has the wrong sign, i.e., abnormal returns are negative following positive recommendations. Either the postings do not entice readers to heavily invest in these stocks or they do not reach a large enough audience to generate any price pressure.

2.4.2.2 - Informational Value:

As for the longer-term performance of recommended stocks, we observe that post-posting CARs are also insignificant. In the up (down) market, an insignificant 1.13% (-0.23%) CAR(1,20) is recorded for all recommendations while positive recommendations earn an insignificant 2.50% (0.44%) over 20 trading days. Thus, there appears to be little value to these recommendations.

More interesting is the performance of these stocks prior to being recommended. We first observe that positive recommendations follow strong short-term performance characterized by particularly significant market-adjusted returns on the day of the recommendation (Day 0). Positively recommended stocks experience highly significant CAR(-20,-1)s of 27.62% and 6.20% in the up and down market, respectively. Clearly, posters tend to favor stocks that have strongly and significantly outperformed the broader

market benchmarks in the recent past. 63% of the CARs over the -20 to -1 window are positive, reinforcing this conclusion.

The small size of the sample of stocks with negative recommendations prevents me from drawing any strong conclusion as to their behavior pre- and post-posting. In line with the momentum hypothesis, mean pre-posting CARs are negative prior to negative recommendations but these CARs are insignificant. Consistent with the “no value” hypothesis, most CARs are insignificant and of mixed sign following negative recommendations although the (1,20) CAR is significantly negative at the 0.05 level in the down market.

CARs for positive recommendations are shown graphically in Figure 2.1. Prior to the positive postings, the ARs are consistently positive, leading to an upward slope for the CARs until the event day. The rate of increase is particularly pronounced during the last few trading sessions and more pronounced in the up market. But these features disappear after the posting date. The ARs revert to “normal”, hovering around zero. The curve flattens and no gain over the index accumulates.

In summary, while posters are strongly influenced by the recent performance of their selected stocks, they seem unable to determine which stocks will continue at the same pace or which will start to perform abnormally in the upcoming period. In sum, most newsgroup members follow an unsuccessful momentum strategy.

Since there are few negative recommendations and less interest in the neutral recommendations, I restrict further analyses to positively recommended stocks. Section 2.5 analyzes the frequency of posters' recommendations.

2.5- Posters' Activity Influence:

Aggregated, the recommendations have little value for the reader. However, partitions may reveal pertinent informational value. In particular, I investigate the influence of posters' activity⁹. I separate multiple posters from one-time posters. A poster with multiple recommendations may dedicate more time to the analysis of companies and thereby hone her skills as a stock picker. A one-time poster might just tout his favorite with disregard to new information. On the other hand a one-time poster could be a person with private information about the company. Wysocki (2000) reports that frequent posters represent a large percentage of traffic on Yahoo! message boards and is suspicious of their intent.

Table 2.5 groups postings according to the activity of their originators. Group 1, 2, and 3 respectively contain the postings of individuals posting four or more, two or three, or single recommendations. Group 1 contains a total of 35 individuals, Group 2 90 and Group 3 313 individuals.

As shown by the F-tests, there is little difference in the pre-posting CAR pattern for frequent, occasional and one-time message posters. However, a weak pattern emerges for performance following the recommendations in that more frequent posters are able to generate higher longer-term CARs than one-time posters. Market-adjusted returns over the (1,20) window of 5.09% (3.26%) are observed in the up (down) market for Group 1 compared with -2.10% (-2.58%) for Group 3. The difference in returns across groups is significant during the down market. Thus, there is evidence that more frequent posters may possess greater selecting skills than casual posters.

Section 2.6 presents the results of a multivariate analysis of the post-posting returns allowing for better control of the multiple influences on the recommendation performance.

⁹ An additional dimension investigated is the difference in returns registered across exchange listings. There is potential difference due to variation in analysts' coverage and float from companies listed on the NYSE to the Nasdaq to the over-the-counter market. However, results indicate that the post-recommendation returns are not statistically different across exchanges.

2.6 - Multivariate Analysis:

Next, I conduct a multivariate analysis in order to determine the respective influence of the factors analyzed above on the long-term performance of positively recommended stocks. I regress CAR (1,20) on a set of independent variables including eight dummy variables: three to investigate the importance of the exchange on which the stock is traded, one to differentiate posting on "alt.invest.penny-stocks" versus "misc.invest.stocks", one for messages cross-posted on both newsgroups, one if the posting is followed by a news release within 7 days, one for posters recommending 2 to 3 stocks and one for posters recommending more than four times. As an independent variable, I add the cumulative abnormal return for the previous 20 trading days and the number of messages in the thread originated by the posting. Finally, in order to measure the level of agreement from the community of posters, I include a directional index, Index D, computed¹⁰ using the thread information for each message. Index D is defined such that it lies between -1 and 1. If all reply messages are negative, the index equals -1; if the opinions are all positive about the company, the index equals one. This index shows whether the recommendations are biased in one direction or are, on average, neutral as to the potential of the stock price. I expect that the higher the index is, the more poster agreement, the better the stock price performance, hence a positive coefficient. I also expect the coefficient on the cross-posting dummy to be positive: if the

¹⁰ I compute this directional index as follows:
Index D: Thread Direction Index:

$$\frac{\# \text{ of Positive} - \# \text{ of Negative on the first day}}{\text{Total \# of Relevant Replies on the first day}} + \left(0.5 \times \frac{\# \text{ of Positive} - \# \text{ of Negative on next days}}{\text{Total \# of Relevant Replies on next days}} \right) \\ 1.5$$

recommendation is cross-posted, it will reach more investors whose impact on the stock's performance is greater. Table 2.6 records the regressions' outputs¹¹.

The regressions' F-statistics are highly significant. After controlling for variation across exchanges, the dummy variable for posting on both newsgroups has the expected sign. If a stock was recommended on both newsgroups, it cumulatively returned 26% (9%) more than a stock only "hyped" on "misc.invest.stocks" over 20 trading days. In other words, the wider the diffusion of the recommendation is, the more reaction the stock price experiences.

The News dummy investigates the presence of private information. A significant positive coefficient would indicate that the poster is providing valuable advice ahead of a news release. For neither market is this dummy coefficient significant. Indeed, the negative sign during the down market indicate either that posters wrongly positively recommend stocks ahead of bad news or that posters positively recommended firms in the hope to inflate their stock price, thereby increasing the profitability of a short trade ahead of negative news. Since the coefficient is again not significant, I can only conclude that no private information is exchanged in these forums.

No significant abnormal return accrues to following frequent posters' advice over one-time posters' recommendations. The weak pattern mentioned in Section 2.5 is not evident in these results, indicating it was driven by the exchange of origin of most recommendations by frequent posters instead of by abnormal stock picking capability.

I expected a positive sign on Index D and the thread coefficients. For both markets, Index D and thread are well behaved but insignificant. If thread messages are "bullish" and numerous, the stock tends to outperform its benchmark but not significantly so.

¹¹ In an alternate specification, I add a dummy variable to discriminate and to control for stocks belonging to the SIC groups 3000 and 7000. The results are not materially altered. In both markets, the coefficients on the dummy are negative but insignificant while the dummy "Both" p-value falls to 0.055.

Reminiscent of the results illustrated in Figure 2.1, strong pre-posting performance does not translate into strong post-posting performance. Actually, the opposite is true and significantly so during the up market. Overall, the momentum strategy is not profitable.

In summary, the regression results mostly confirm the previous finding that the Internet recommendations have little value. This finding holds whether the poster recommends few stocks or many, whether subsequent posters agree or disagree, and whether the recommendation precedes a news release or not. Only if the recommendation appears on both newsgroups is there evidence of any informational value.

2.7 - Conclusion:

The completed analysis of the data provides several insights about the importance of the newsgroups investigated. First, the newsgroups provide little value to their readers. Neither in the short- nor in the long-term do I uncover any significant performance above the benchmarks. Second, I show that the impact on returns immediately after the posting is not significant. In other words, I do not record any price pressure effect.

Additionally, I document that, even in the absence of agency costs faced by professional analysts, the buy-sell ratio is of the same magnitude and not tilted towards more sell recommendations that would be publicized by short-sellers. We need to find other explanations for the pattern of buy-sell recommendations.

Overall, the posters favor smaller firms, high price to book ratios, technological firms, and extreme short-term performer stocks. From the evidence gathered about the reasons prompting recommendations, these individuals have access to substantial public information, and follow a well-defined personal strategy. At the aggregate level, a general tendency of following a momentum trading style emerges. Sixty percent of stocks performed extraordinarily well before being recommended. However, there is no evidence they pass on any new information.

In summary, the fears raised by the media about the destabilizing power of such traders that participate in these discussions can be mollified.

CHAPTER 3

Essay 2: The Informational Value of Earnings Whispers

3.1 - Introduction:

One of the most interesting financial market developments of recent years has been the rise to prominence of so-called earnings “whispers.” These are under-the-table or informal forecasts of company earnings which circulate on the street and in Internet chat rooms but whose source or lineage is usually unclear. Numerous services, such as WhisperNumber.com, Earningswhisper.com, and GetWhispers.com have sprung up dedicated to collecting and providing this information. CNBC regularly reports and discusses these numbers. When the price of a firm’s stock falls after it announces earnings exceeding analysts’ official forecasts, the price decline is often attributed to the company failing to meet a higher “whisper” forecast. Indeed, one purveyor of whispers claims a 60%¹² success rate in predicting whether a firm’s stock will rise or fall when the official earnings are released.

The informational validity of whispers has not gone unchallenged however. Many analysts dismiss them as nothing more than noise emanating from dubious sources. A recent Wall Street Journal article reported that their popularity on the street has fallen sharply: “the whispers have turned into whimpers.”

The debate over the informational value of whispers largely reflects a debate over their source. In the view of whispers’ critics, those starting the whispers are at best uninformed gossipers and at worst wistful market manipulators. In the eyes of their proponents, whispers represent either the estimates of insiders or a more accurate measure of the analysts’ true forecasts. It is argued that in order to obtain or keep the favor of managers, analysts may alter or shade their official forecasts. Or, they may choose to update their official forecasts only when there is a major change, instead of whenever a piece of new information

¹² See the WhisperNumber Statistical Accuracy page of the WhisperNumber.com site.

causes them to update their opinion. Supposedly, however, these analysts whisper their true timely forecasts informally to their best clients who pass them along to others.

With the recent publication of Bagnoli, Beneish and Watts (1999), the debate over the informational value of earnings “whispers” has moved from the investment and business press to academic journals. They find that whispers are a valuable information source. Their evidence indicates that whispers are more accurate predictors of earnings than analysts’ forecasts and that at least part of this information is impounded in market prices, i.e., that the market values the whispers.

The present paper contributes to this debate with a larger, more comprehensive and more recent database. Contrary to Bagnoli et al., I find that whispers have little informational value. They are not more accurate predictors of earnings than analysts’ forecasts. Indeed, the opposite appears to be the case. Moreover, a trader cannot make abnormal returns on whispers – except possibly by betting against them, i.e., by shorting when the whisper exceeds analysts forecasts and longing when the opposite is true. The evidence is mixed on whether the whispers are impounded in stock prices.

In the following two sections, I provide first the theoretical background for the appearance and relevance of whispers and then proceed to describe the data collection process and summarize the main characteristics of the sample firms. In Section 3.4, I revisit the question of the accuracy of whisper estimates. Section 3.5 addresses whether whisper numbers represent the market’s true expectations and hence provide a good indicator of stock price movement and a tool for devising a trading strategy. In Section 3.6, I inquire if there is valuable information in the whispers and implement a trading strategy suggested by Section 3.5’s results. Finally, Section 3.7 concludes the paper.

3.2 - Theoretical Background:

Extensive attention in the accounting literature has been placed on to documenting the behavior of analysts. As Liu, Nissim and Thomas (2000) remind us, the significance of this research cannot be understated. They show that the pricing error of stocks is minimized when based on forward earnings measures. Kim and Ritter (1999) attain similar results for the initial public offering market. Both recent inquiries confirm earlier studies such as Benesh and Peterson (1986), Day (1986) and Pike, Meerjanssen and Chadwick (1993).

Due the importance of their forecasts, analysts' behavior has been closely scrutinized and recent studies indicate that there are reasons to suspect the accuracy of analysts' official forecasts. Matsumoto (2000) argues that companies intentionally seek to avoid negative earnings surprises both by managing earnings and by guiding analysts' forecasts. Feeling pressure to maintain a relationship in good standing with firms whose brokerage and investment banking needs they fill, analysts are parties to this strategy. Pratt (1993) and Womack (1996) find reflections of these pressures in the extreme ratio of buy versus sell recommendations issued by analysts. Consequently, investors have the right to question the validity of the earnings surprise numbers that are presented to them.

At the same time, large earnings response coefficients add an incentive for individual investors to estimate accurately upcoming earnings numbers. Abarbanell, Bishop and Leheavy (2000) propose these high sensitivities to earnings information as reason for the intensification of the earnings management game. As stock prices have become more sensitive to earnings surprises, investors' incentive to examine closely analysts' predictions increases. In this context of biased and influenced analysts' forecasts delivered to an anxious marketplace, it is reasonable to expect investors to gladly give credence to an alternative, supposedly unbiased, source of earnings forecasts: whispers. Whispers are an obvious choice as they are assumed to derive from the true best earnings estimates constructed by analysts and communicated privately to their most valued clients.

In this paper, I investigate whispers' legitimacy as a valuation tool and an investment compass. Following the traditional approach, I start by comparing whispers to actual earnings and by assessing their forecasting performance. Since whispers are supposedly an improvement on analysts' forecasts, the latter will perform as benchmark.

Then I turn to the question of whether whispers are a better measure of the market's true expectations than analyst's estimates. In addition to investigating the price movement surrounding the release of earnings, I compare in a multivariate setting the explanatory powers of the respective measures of market expectations. Finally, I evaluate the performance of a trading strategy based on the respective position of whispers and analysts' forecasts.

In the following section, I describe the collection process, provide details about the sample of whispers and present characteristics of the sample firms.

3.3 - Data:

3.3.1 - Sources of Whispers:

Whispers are circulated widely on the Internet in various forums: websites, chat rooms, message boards, mailing lists and newsgroups. In the first academic study of whispers, Bagnoli et al (1999) combine the information they gather from reading 600,000 messages posted in discussions on major investor websites with information garnered from classical conduits of financial research information: the Wall Street Journal and financial newswires. I benefit from the improvement made in the distribution of whisper information since the previous study's efforts. As whispers progressively entered the consciousness of individual investors, numerous websites have organized to disseminate this information.

I concentrate this study on the numbers found on www.whispernumbers.com. The breadth of coverage and clarity provided on this site makes it the premier choice for whisper data. The advantages to using this unique resource are data consistency and standardization

and, due to the website methodology, comprehensive coverage. By using whispers collected by another party, I ensure that my sample¹³ is not influenced by any personal biases.

WhisperNumber.com¹⁴ methodically searches, via proprietary software, a total of 300,000 messages per day on key Internet message boards¹⁵. Appendix 3.A shows several examples of such postings. Once the references to whispers are found, WhisperNumber.com data miners assess the validity of the numbers and input them in the database. The average of all these whispers becomes the “official” whisper posted on the website and is displayed along with the number of point estimates composing the whispers. Appendix 3.B reproduces a sample screen from the website itself.

¹³ I recognize that WhisperNumber.com not reporting a whisper for a company does not mean that no whisper is circulated. However, the thorough methodology of acquisition of the reported numbers and the constant increase in individual investors registrations suggest it approximates the total population of whispers.

¹⁴ Four other sites providing whisper information regularly cited in the financial press are: www.thewhispernumber.com, www.earningswhispers.com, www.streetiq.com and www.jagnotes.com. It is my experience that the presentation and accessibility of historical whispers data on the other sites is not as convenient as on WhisperNumber.com. While some offer historical whisper data for sale, others do not appear to have the information available at all. Moreover, the methods used to derive the posted whispers differ. At many websites, the estimates are generated by the website itself. For instance, according to the L.A. Times, TheWhisperNumber.com often extrapolates a current whisper number based on a company's past earnings performance. For example, if a company has beaten consensus estimates by a penny for four straight quarters, the whisper posted by this site might be a penny higher than the current consensus. At StreetIQ.com, the site's chief reference tool is prior earnings history. Compiling previous earnings surprises, company announcements in advance of earnings reports and, to a lesser extent, “rumors that traders post on (Internet) message boards,” the site determines the whisper. As Scott Moss, editor for StreetIQ.com, says: if a company's estimates by analysts are traditionally too low by 10 percent, the site adds that back and get the whisper number. According to Bloomberg magazine, EarningsWhispers.com, started by Shannon Puls, gets its whisper estimates directly from the companies, although not always from people in investor relations. Puls tries to provide a whisper number based on what he sees on the message boards in addition to using what the company has done in the past as a guideline when there are conflicting estimates. I have not been able to ascertain the philosophy behind the whispers reported on Jagnotes.com. In light of this information, it appears that the numbers provided on WhisperNumber.com represents a wider consensus of opinions than any other sites. Also, the whispers on this site are true whispers, not the website's own estimate, and are less subject to website manipulation.

3.3.2 - The Sample:

My sample of whisper numbers covers the period from the fourth quarter 1998 through the second quarter 2000. The total number of whispers found on the site is 1,453 corresponding to 1,453 firm-quarters covering 709 firms. In order to compare the accuracy of the whispers to analysts' forecasts, I use analysts' forecasts of earnings recorded by New York's Institutional Broker's Estimate System (I/B/E/S). Restricting the sample to the firm-quarters for which I/B/E/S reports analyst forecasts reduces the sample to 943 firm-quarters and 308 firms. This contrasts to Bagnoli et al (1999) whose final sample consisted of 288 firm-quarters of forecasts pertaining to 127 firms.

Table 3.1 details the SIC codes of the companies included in the sample. In addition, it provides a partition of the frequency of whisper occurrence. While some companies have a whisper in only one quarter, others like Amazon, IBM or Yahoo have had whisper numbers consistently throughout the sample period. Most whispers concern technological companies in SIC categories 3000 and 7000. Over 50 percent of the firms covered by whispers are manufacturing high-tech products, developing software, or retailing on the Internet. The time trend of firms with whispers shows an impressive increase from 33 firms for the fourth quarter of 1998, to 290 for the second quarter of 1999 to 467 firms for the first quarter of 2000. This trend reflects two phenomena. First, more people were circulating whispers on the Internet. Second, WhisperNumber.com gradually increased its coverage of firms.

Table 3.2 provides a snapshot of the characteristics of the firms included in the sample as collected from Bloomberg. One striking feature of these companies is their size be it measured as total assets which average almost \$13 billion or as market capitalization whose mean (median) is \$13.5 billion (\$1.6 billion). If, on the one hand, one believes that whispers develop to alleviate asymmetrical information, one would expect that larger corporations that

¹⁵ In addition to this web-wide search, individuals visiting the site are invited to share their estimates for inclusion in the consensus, conditional on their reasonability. In July 2000, the site boasted of

are more readily followed by analysts would not warrant the proliferation of whispers. If, on the other hand, one adheres to the view that whispers originate with analysts updating their best customers, it would stand that larger companies with a larger analysts following would incite more whispering. The sample evidence lends credence to the latter view. Table 3.2 shows that, on average, approximately 10 analysts cover any given sample company, and as many as 20 analysts on average follow the most frequently whispered-about firms. Overall we see that the more frequent the whispers, the larger the company, the less debt-burdened the company, the older the company and the riskier the company as judged by its conventional beta.

3.4 – Whisper Accuracy:

In their paper, Bagnoli et al. conclude that “whisper forecasts [of quarterly earnings] tend to be more accurate than First Call forecasts” and that “trading strategies based on the difference between whisper and First Call consensus forecasts ... yield significantly positive returns”. They base this conclusion primarily on the significant difference they find in the mean and median of the squared forecast errors of whispers and First Call estimates.

Similarly, I measure the relative bias and accuracy of whispers by examining the mean and median of, respectively, the forecast errors and the absolute values of the forecast errors. The forecast error is defined as the difference between actual earnings and the forecast scaled by the absolute value of actual earnings per share¹⁶.

12,000 registered users with a daily traffic of 20,000 viewers.

¹⁶ This deflator is the most popular in such studies. Lorek (1979), as repeated by Patz (1989), states that “the use of forecasted earnings as a base implies measurement of a firm’s ability to achieve a predicted result, rather than a predictor’s ability to forecast an outcome”. Also, using the forecasted earnings would prevent a clear comparison of the performance of the two measures of forward-looking earnings I investigate since the deflator would be different in the whisper and I/B/E/S statistics. I elect to use the actual earnings number reported by I/B/E/S versus the ones available in Compustat. This choice follows Abarbanell and Lehavy’s (2000) finding that forecasts errors based on Compustat’s earning records are 1.5 larger than errors using I/B/E/S actual earnings measures. This confirms that the objective of analysts is to forecast the “ordinary” portion of earnings and therefore the measure defined by I/B/E/S is a more appropriate benchmark for assessing accuracy.

In Table 3.3, I report the mean and median of the forecast errors and the absolute forecast errors for 1) the I/B/E/S consensus, 2) the last forecast issued and registered in the I/B/E/S database and 3) the whisper forecast. A typical explanation for the better forecasting performance of analysts' forecasts over time-series models is their timeliness: analysts have access to and incorporate in their forecast up-to-date information. The same argument in reverse is made in favor of the whisper over the I/B/E/S consensus. Many official analysts' forecasts were last updated immediately after the previous quarter earnings announcement whereas whispers are circulated closer to the actual release date, generally in the week leading to announcement according to Bagnoli et al. In order to compare whispers with official forecasts closer to the same date, I report figures for the last forecast included in the I/B/E/S consensus^{17,18} as well as the consensus itself.

Confirming the findings of Bagnoli et al., in Panel A¹⁹, both the mean and the median clearly show that analysts' official forecasts tend to underestimate earnings while whispers tend to overestimate them. The fact that analysts' forecast are lower than the actual earnings confirms the suspicion that company pressure drives analysts' forecasts downward. A median test confirms that the forecast errors are different at the one percent level. While alleviating some of the difference, the measure involving the most recent individual I/B/E/S forecast does not fare much better than the overall consensus. While correcting the pessimism of the official forecasts, whispers appear too confident in the performance ability of the firms in that both the mean and median forecast errors are significantly negative. These numbers are in line with a recent whisper study performed by Bloomberg (1999).

¹⁷ In other formulations not reported for clarity of the tables, I run the same analyses with two other measures. First, I develop an average of the forecasts made within the month leading to announcement and second, I compute the mean of the forecasts recorded in the last five trading days before the earnings release. The tenor of the results is unchanged with these two measures.

¹⁸ It is important to note one caveat of the I/B/E/S database in this timeliness adjustment. Several authors (O'Brien (1988), Philbrick and Ricks (1991)) point out that there exists a lag in reporting the analysts' forecasts in the database. O'Brien finds an average lag of 34 trading days from the time of the forecast creation to its first appearance in the database.

Figure 3.1 illustrates the respective positions of both the I/B/E/S and the whisper forecasts errors.

The means and median in Panel A measure only bias, not accuracy. A measure which grossly underestimates earnings half the time and grossly overestimates half the time would be unbiased though very inaccurate. In Panel B, I compare the respective accuracy of the various forecast measures by examining the absolute value of the forecast errors^{20,21}. There, we see that both the consensus and most recent I/B/E/S forecast miss true earnings by 33%, on average while the average difference between the whisper measure and actual earnings is 40%. The median absolute error is also greater for whispers but the difference between the medians for whispers and analysts' forecasts is not significant. In summary, contrary to some assertions, the whispers are clearly not more accurate than the analysts' forecasts of earnings.

Following the procedure in Herzberg, Guo and Brown (1999)²², I report in Table 3.4 results on whether the I/B/E/S measure or the whisper forecast is closer to actual earnings. In the first column, we see that I/B/E/S's forecast error is smaller (in absolute terms) than the

¹⁹ A similar but streamlined analysis was performed for the sample of 1,453 whispers with results of the same tenor.

²⁰ To eliminate the impact of outliers, I replicated the table using two alternate methods. First, I windsorized any forecast error in excess of 1, i.e., I eliminate any firm-quarter for which any of the three reported forecasts is more than 100% away from the actual earnings. In general, this methodology will eliminate the impact of firms close to breaking even, for which it is easy for the forecast to deviate tremendously in percentage term from the actual earnings due to a small denominator. The results are of the same tenor. Second, in an effort to avoid having to windsorize the data, I preempt the introduction of such outliers by restricting the sample to firms with actual earnings of absolute value greater than 5 cents (see Chung and Kim (1994)). Using this methodology, I am left with 804 observations and the median I/B/E/S forecast error becomes 0.07 while the median whisper forecast error is -0.02.

²¹ Bagnoli et al. used mean sum of unscaled squared errors to measure accuracy. Replicating the analysis with my sample, I find that the median whisper unscaled squared errors is 0.0009 while it is only 0.0005 for the I/B/E/S consensus and the difference is significant at the 1 percent level. The whispers are not as accurate as the analysts' forecasts.

²² Herzberg, Guo and Brown do not deflate their measures "because of interpretation problems associated with deflating" citing Degeorge, Patel and Zeckhauser (1999). These authors critique the use of deflators on the ground that "EPS is measured (and reported and forecast) rounded to the closest penny" and hence "spurious patterns can arise in the distribution of such normalized EPS" (p.16). For consistency with my measures, I decided to deflate in the above analysis. I also generated the tables without deflating and the results are similar and tend to favor I/B/E/S forecasts even more.

whisper forecast error 52.3% of the time. The whisper and I/B/E/S forecasts are identical 2.3% of the time while the whisper is closer to the actual earnings in 45.4% of the observations. Once I use the timelier latest analyst's forecast, the percentage of times the whisper is closer drops to 39.7% while ties occur in 10% of the cases. Eliminating the observations when the whisper and I/B/E/S consensus are identical, the percentage of time the analyst consensus is closer is significantly greater than 50%. Again the evidence indicates that whispers are not more accurate than analysts' forecasts. Indeed, the opposite appears to be the case.

In order to measure if when the I/B/E/S forecast errors are smaller, they are more on target than when whispers forecast errors are smaller, I compute the weighted accuracy measure. The weights are based on the magnitude of the accuracy superiority of the forecast. For example, if we have two quarters where the I/B/E/S consensus, whisper and actual numbers are respectively 48 and 48 cents, 55 and 50 cents, and 50 cents in each quarter. One can see first that the frequency is 50% since for the first quarter the I/B/E/S forecast error is smaller but greater in the second quarter. In the first quarter, the I/B/E/S consensus is 2 cents away corresponding to a forecast error of 4% and the whisper is 5 cents or 10% away thus the I/B/E/S consensus has a 3 cents or 6% advantage over the whisper. In the second quarter, the whisper is closer, being right on target, while the I/B/E/S consensus is 2 cents or 4% away, giving the whisper a 2 cents or 4% advantage. The weighted accuracy measure in this case becomes: 6% divided by 10% or 60 percent. The weighted accuracy is computed as the advantage of the I/B/E/S forecast error when it is smaller divided by the total advantage by either forecast in all cases.

Weighted accuracy measures are shown in Table 3.4. They also indicate that the I/B/E/S consensus tends to be more accurate than the whisper numbers. The weighted accuracy is 60.9% for the I/B/E/S consensus and 60.5% for the forecast based on the most recent revision.

Finally, I examine whether the relative accuracy varies by industry. We know that the predictability of earnings by analysts is conditional on the industry in which the particular firm competes (Brown (1997)). I decide to use the Bloomberg characterization of Industry Sector and Industry Group to define the partition instead of using the SIC codes because the number of multiproduct firms and the prevalence of diversification make classification by product arbitrary (Kim and Ritter (1999)). As some Industry Groups have few firms present in the sample analyzed, I only show the groups with at least 10 observations. As suspected, the accuracy measures vary with the activity sector. Panel A shows whispers are not significantly more accurate than the I/B/E/S consensus in any industry and only in the Consumer, Non-Cyclical sector does the I/B/E/S consensus significantly outperform the whisper numbers in term of accuracy. When looked at a finer level in Panel B, it appears that for most sectors the whisper and I/B/E/S forecasts are as likely to be closer to the actual earnings.

The last three tables' accuracy measures indicate that whispers are not more accurate forecasters of actual earnings than the I/B/E/S consensus. Instead several measures indicate that the opposite is true – that analysts forecast earnings better. This leaves open the question as to whether whispers provide any additional information. I use a regression approach to determine the respective informational value of analysts' consensus and whispers. I estimate the following equation:

$$(AE_t - AE_{t-1}) = \alpha + \beta (I/B/E/S_t - AE_{t-1}) + \gamma (W_t - AE_{t-1}) + \varepsilon_t$$

where AE_t and AE_{t-1} represent the actual earnings this and the previous quarter, respectively. $I/B/E/S_t$ and W_t are the analysts' and the whisper's estimates for the current quarter's earnings. So $I/B/E/S_t - AE_{t-1}$ is the forecast earnings change according to analysts, $W_t - AE_{t-1}$ is the forecast change according to whispers and $AE_t - AE_{t-1}$ is the actual change. If only the analysts' forecast contains information, we should find that $\beta > 0$ and $\gamma = 0$. On the contrary, if

only the whisper is informative then we should find the opposite, $\beta=0$ and $\gamma>0$. Finally, if both contain separate information about the upcoming earnings release, we should have both β and γ greater than zero.

Results in Table 3.6 show that the $\hat{\beta}$ significantly exceeds zero while I cannot reject the hypothesis that γ is equal to zero. The regression rules out any predictive gains from combining analysts' forecast and whisper information. Whispers do not provide any information above that incorporated in the analysts' consensus. The intercept is significantly positive, indicating that were the analysts' consensus and the whisper to equate last quarter's earnings, companies would report a significant increase in earnings over last quarter, thereby surprising the market.

In summary, none of our forecast accuracy measures indicate that whispers are better forecasters of actual earnings than the I/B/E/S consensus. Indeed, analysts' forecasts appear more accurate – though they do tend to underestimate. Furthermore, whispers do not incorporate any information not already reflected in the analysts' consensus.

3.5 – Do Whispers Impact Stock Prices?:

WhisperNumber.com reports that whisper numbers are good predictors of a stock's price reaction to the earnings release. Their full year 2000 statistics show a 60% rate of whisper accuracy in predicting stock reaction, i.e., if actual earnings exceed (fall short of) the whisper, the stock's price rises (falls) 60% of the time based on the 5-day stock price's moving average. Over a 24-hour horizon, the whisper numbers were a 58% accurate predictor. These statistics imply that whispers accurately capture the market's earnings expectations.

I reproduce similar statistics for my sample of 1,453 whispers collected from WhisperNumber.com. I decide to use market-adjusted returns in characterizing stock price

reactions²³ using returns on the S&P 500 Index to define the market benchmark. I define the 24-hour abnormal return as the market-adjusted return from the close of the day before the earnings announcement to the close of the day of the earnings release. The 5-day return is defined as the market-adjusted return from the close of the day before the earnings release to the close of the fourth day following the earnings announcement. If the abnormal returns are negative after the earnings fall short of the whisper or if the abnormal returns are positive after the earnings beat the whisper, the whisper number is dubbed a good predictor of the stock price reaction. Overall, we see in Panel A of Table 3.7, the whisper number correctly predicts the sign of the 24-hour (5-day) stock's price's adjusted return 54.6% (55.0%) of the time.

For further insight, I break down the results by success or failure to meet the whisper. On the one hand, when actual earnings exceeded the whisper, the first day abnormal return was positive only 49.1% of the time. This percentage is not significantly different from 50%, which means that the abnormal returns are equally likely to be positive or negative. On the other hand, if the actual earnings fail to meet the whisper's expectations, the market-adjusted return is negative more than 58 percent of the time over both 24 hours and 5 days. This number is significantly larger than 50%, indicating that there are negative consequences to failing to meet the whisper number. In section 3.6, I investigate if these consequences are economically meaningful.

The scenarios shown in Panel A do not reflect the location of the I/B/E/S consensus relative both to the whisper number and to the actual earnings. Consequently, they do not tell us whether whispers or analysts forecasts best represent the market's expectations. In

²³ I also compute the statistics using a straight buy-and-hold return and obtain similar results except for the case where whispers are met but actual earnings fail the I/B/E/S consensus. While the market-adjusted returns show that the 24-hour abnormal returns are positive in 58.3% of the time, the straight returns are positive in only one third of the cases. Still, this number is not significantly different from 50% but is significantly different from 0.

Panel B, I concentrate on the two situations -- of four possible -- when the whisper and analyst estimates imply different price reactions.

To assess truly if the whisper number has become the true market's expectations as claimed by some on-line enthusiasts or to ascertain if the I/B/E/S estimates remain the market's yardstick, two cases must be scrutinized. First, in some cases, the actual number might fall short of the whisper but still beat the I/B/E/S estimate. If the whisper is a more accurate measure of the market's expectations, the stock price should go down on the release. According to the statistics in Table 3.3, this scenario should be relatively common and out of the 1,453 possible occurrences, it occurs 306 times. The stock price underperforms its benchmark in approximately 56 percent of these situations²⁴.

The second scenario of interest occurs when the actual earnings beat the whisper but fail the I/B/E/S consensus. This scenario is far less common and happened only 24 times in the whole sample. Under the assumption that the whisper numbers represent the market's true expectations, the stock should outperform the benchmark and it does so approximately 60 percent of the time. Consequently, it appears that, while not as accurate as the I/B/E/S consensus in predicting actual earnings, the whisper number is a slightly better predictor of stock price reactions following the earnings release.

The results in Table 3.7 indicate that whispers may be a better measure of the market's earnings expectation than the analysts' consensus since when announced actual earnings exceed analysts' forecasts but are less than the whisper number, the price of the stock tend to fall more often than it rises. This considers only the direction of the price

²⁴ It follows from results in both Panels of Table VI that the 24-hour market-adjusted return when actual earnings beat both whisper and I/B/E/S consensus is positive half of the time. Upon computation, the precise percentage is 50.1% and is 48.0% over the 5-day horizon. While this percentage appears low, it reflects two phenomena: a dilution in market reaction to positive news and partial anticipation of the announcement. The first phenomenon has been ascribed in the financial press to the prevalence of positive earnings surprises (Matsumoto (2000)). The second phenomenon is reflected in the fact that the market-adjusted return from the close of the fourth day before the announcement to the close of the announcement day is positive 60% of the time, indicating that the stock price react in anticipation of the announcement.

adjustment, not its magnitude, and likewise does not take into account how close actual earnings are to both the analyst consensus and the whisper number. Consequently, I also examine this issue using a regression approach.

My approach is based on the supposition that the market reaction to an earnings announcement is a function of the earnings surprise. Specifically, I posit that:

$$CAR_t = \alpha + \beta \left(\frac{AE_t - ME_{t-1}}{P_{-15}} \right) + \varepsilon_t$$

where CAR_t is the cumulative market-adjusted return over the period from just before the earnings release to a chosen horizon after the earnings release, AE_t represents the actual earnings announced at time t and ME_{t-1} represents the market's earnings expectations just before the earnings release (time $t-1$). To test whether the whisper or the analyst consensus best represent the market's earnings expectations, I estimate the equation:

$$CAR_t = \alpha + \beta_0 \left(\frac{AE_t - I/B/E/S_{t-1}}{P_{-15}} \right) + \beta_1 \left(\frac{I/B/E/S_{t-1} - W_{t-1}}{P_{-15}} \right) + \varepsilon_t$$

where $I/B/E/S_{t-1}$ is the analyst consensus and W_{t-1} is the whisper number. I deflate the differences using P_{-15} , the stock price prevailing 15 trading days before the earning release, in keeping with Christie's (1987) results. If the analyst consensus accurately measures the market's expectations and the whisper number does not, then I expect $\beta_0 > 0$ and $\beta_1 = 0$. If the whisper represents the market's expectations, then I should observe $\beta_1 = \beta_0 > 0$. If both provide information on the true market consensus, I expect to observe $\beta_0 > \beta_1 > 0$.

Results are shown in Table 3.8 for various adjustment windows. $CAR(-1,1)$ represents the market-adjusted return earned from opening a position in the stock at the close of the day preceding the earnings release and closing the position the day following Day 0, the day of the earnings release. $CAR(-1,2)$ and $CAR(-1,4)$ are computed similarly for the different closing dates. For all three CAR measures, we observe that $\hat{\beta}_0$ significantly

exceeds zero. $\hat{\beta}_1$ is negative and not significantly different from zero. Hence I can reject the null hypothesis that the analyst consensus does not represent the market's expectations but cannot reject the null hypothesis that the whisper does not represent the market's expectations.

Interestingly, in the regressions for the two longer periods, the intercept is significantly less than zero implying that if the whisper and analysts' forecasts are equal and actual earnings match the forecasts, then the stock price will significantly underperform its benchmark. This implies that both underestimate the market's earnings expectation.

In summary, my results on whether whispers or analysts' forecasts best represent the market's earnings expectations are mixed. While the results in Table 3.7 indicate that whispers might be a better measure of the market's expectations, those in Table 3.8 indicate that the analyst consensus is better.

3.6 – The Trading Value of Whispers:

In Section 3.4, I showed that whispers are not as accurate and add no additional information regarding actual earnings above that already incorporated in the official forecast. In the previous section, I showed that whispers do not necessarily represent a better measure of market's expectations of corporate performance. In this section, I examine a final aspect of whispers – whether whispers can form the basis of a profitable trading strategy. If one believes that the market is semi-strong efficient, all publicly available information is already impounded in the stock price of companies. Therefore, if there is informational value in the whispers, an opportunistic individual investor could trade beneficially on the information provided by the whispers. I examine the returns to a trading strategy harnessing the whispers' information.

In developing a trading strategy based on the whispers' information one would like to rely on their position vis-à-vis the actual earnings released. However, ex-ante, this relative position is unknown. As a palliative to this problem, Bagnoli et al. designed a trading strategy that buys the stock 5, 3 or 2 days before earning announcement if the whisper is greater than the consensus or shorts the stock if the whisper is less than the consensus. I adapt their strategy to open the position at the close of the day before the earnings release and to carry the positions for 2, 3 or 5 days. The purpose of this alteration is to allow the stock price to adjust to the earnings announcement²⁵. As previously, the returns are computed net of returns on the S&P 500 Index. The results of the various strategies are reported in Table 3.9.

Overall, the strategy loses an insignificant 0.44% over two days. This result is consistent with Table 3.6's results wherein I showed that whispers do not contain any information above that incorporated in the analysts' consensus. The marginally significant losses over 3 and 5 days of 0.81% and 1.07%, respectively, are better understood by examining long and short positions. We see that the long positions are significantly losing money while short positions are earning money. Despite the promises made by on-line resources, I find that a strategy trying to capitalize on the assumed informational value of whispers fails to generate abnormal returns. On the contrary, my evidence suggests that betting against the whispers can be beneficial. In the case of the whisper estimate exceeding the analysts' consensus, Table 3.9 suggests that an individual could earn significant abnormal returns by shorting the stock the day before the earnings announcement and closing her

²⁵ I repeated the analysis using Bagnoli et al.'s methodology and found no material difference in the results. Further, in an effort to conciliate the two views, one predicting the impact happens before the release while the other believe that the price adjustments are made after the actual earnings are circulated, I examined a third trading strategy. Reading through the newsletter sent by WhisperNumber.com to their subscribers, I construct a sample of 112 whispers highlighted from May 8th, 2000 to October 25th, 2000. The positions are taken at the close of the day when I received the email, hence became cognizant of the particular whisper. I close the position after holding it for five days. Thereby I vary the lead-time to actual earnings release in the timing of the purchases. The cumulative abnormal returns a free subscriber could earn are once again not significant.

position after the actual earnings release. This finding is consistent with previous conclusions. In Section 3.5, there is indication that market participants believe falsely that whisperers have forecasting ability greater than analysts and impound the whisper information in prices. Once the earnings are released and the market's mistake is unveiled, prices react accordingly. Therefore, one, as shown, could generate abnormal returns by betting against the worthless whisper information.

In summary, I find that the whispers' information cannot be used to generate significant market-adjusted returns²⁶. Whispers do not incorporate any unique information.

3.7 - Conclusion:

In this paper, I analyze a large, recent and comprehensive sample of whisper numbers. I investigate different aspects of whisper numbers: their accuracy relative to analysts' forecasts, the market's view of their value as impounded into prices, and their informational value.

I conclude that whispers are not as accurate as they have been depicted in the past. In this larger and more recent sample, whispers are less accurate than analysts' forecasts. I find that the I/B/E/S consensus, although biased downward, is a better predictor of earnings under several metrics. Whispers do not add any information to investors' information set.

I report mixed support to the popular opinion that whispers reflect the true market's expectations. Stock prices' reactions to earnings announcement indicate that whispers are the better measure of anticipated earnings. Even though the market partially impounds the whispers' information into price, cumulative abnormal returns are determined by the analysts' consensus information only, indicating that whispers contain no unique new

²⁶ Individual investors would have to use the whisper information in another way to try and extract any value from it. Possibly, the whispers are a good tool in helping rebalancing one's portfolio. If the investment community sentiment, reflected in the whisper, is that the company will fall short of

information. Consequently, it is not surprising that one cannot develop a profitable trading strategy to harness whispers' information. I am not able to generate abnormally high market-adjusted returns from buying stocks when their whisper is higher than the I/B/E/S consensus and shorting the stock in the other instance. On the contrary, due to the false belief held by some market participants, trading the opposite positions becomes a profitable strategy.

If it is true that analysts possess valuable information they decide not to disclose in their public forecast but volunteer to their most valued clients, this information does not percolate to the widely distributed whispers. Whisperers build their forecast from an information set similar to that of publicly reported analysts' forecast; yet, they cannot achieve the same accuracy.

earnings this quarter, this might reflect a longer-term direction in earnings. One would have to conduct a long-term returns analysis to decide on this issue but it is out of the scope of this article.

CHAPTER 4

Essay 3: Certification, Reputation, and Warranties as Remedies for Informational Asymmetries: A Study of the On-line Comic Book Market

4.1 – Introduction:

In pursuit of efficiency, financial market participants expend valuable resources to eliminate informational asymmetries. Hiring third party financial intermediaries to reduce the knowledge differential among market players allows for better allocation and distribution of resources. For instance, bond-rating agencies provide an indicator of the quality of corporate debt while auditors attest to the integrity of firms' accounting practices. Yet, obtaining "certification" from a third party is only one of the choices available to companies wanting to communicate credible information about their creditworthiness or their products' performance, compliance, or quality. Alternatively, firms can develop reputational stock that partially alleviates any informational asymmetry. Issuing warranties is yet another solution.

This study investigates the relative importance of such alternatives in the comic book on-line auctions run on eBay. The condition of a comic book is the single most important determinant of its value. In a market for which condition is so crucial, on-line buyers must beware since they cannot directly examine the comic book before purchase. Consequently, sellers must find ways to communicate the quality of their items. Sellers have four ways to alleviate the information asymmetry and facilitate buyers' purchase. First, and the least costly, is providing a scanned image (scan) of the comic book for auction. The scan provides relevant information about the condition of the comic book to buyers. However, the scan cannot reveal all the information a discriminating buyer would want. Second, sellers can develop a reputation of fairly grading their material. As a seller's reputational stock increases, the buyers will become more assured of the product's quality and reflect this confidence in their bids. Part of eBay's success lies in its organizing a clear measure of

reputational stock for all participants in its web-auctions. Third, sellers can guarantee the satisfaction of the winning party by allowing for full-refund returns. It is common for eBay comic book sellers to offer refund terms, such as a 10-day return policy upon receipt of the comic book. A buyer who does not agree with the grading of the comic book can use this recourse to recover his investment minus shipping costs. Finally, sellers can certify the comic book's grade via a third-party certification agency, the Comics Guaranty, LLC (CGC).

This market offers both certified products and a readily accessible measure of sellers' reputational stock. I propose to quantify the influence of certification and that of reputation on carefully matched auctions' results. In particular, I will test the hypotheses that the CGC-graded comic books command a premium over similar non-certified comic books, that seller's reputation matters more in an auction for a non-certified comic book than for a certified comic book, and finally that the CGC's fee structure is economically consistent with the benefits accruing to sellers. The implications of the results bear on the value provided by various financial intermediaries.

In the following section, I provide basic information about the comic book marketplace and the CGC. Then, in section 4.3, I profile the research about on-line auctions in general and eBay in particular and develop hypotheses. Section 4.4 describes the sample and the variables and Section 4.5 presents the results. Section 4.6 addresses issues relevant to the comic book marketplace while Section 4.7 concludes.

4.2 – Comic Book Marketplace:

4.2.1 - Overview of the Comic Book Collecting Marketplace:

Generally described as a clear piece of Americana, the publication and distribution of weekly or monthly comic books was started in the United States and remains a predominantly American phenomenon. Comic book collectors, before the advent of the Internet and auction

sites, had only few avenues to complete their collections. They could depend on local retailers, but the stream of books coming in for sale is erratic. Serious collectors had to rely on mail-order dealers with extensive listings and more infrequently on the regional and national comic book conventions.

Not considered collectibles until the early 70's, a major component of the price realized by comic books is their scarcity, which depends on the number of existing copies. Demand is driven by other factors. The main aspect of demand is the condition of the comic book. Time and children have not always been kind to the books that survived the last sixty years. Consequently, a grading structure has developed in the marketplace to describe the condition of a comic book. The grades range from Mint to Poor. A Mint book is in perfect condition with no defects, as if coming right off the press. On the other side of the spectrum are Poor comics to which artwork or pages are missing and the overall condition is such that the book is not collectible. The intermediate grades are broadly Near Mint, Very Fine, Fine, Very Good, Good and Fair with a total of 25 different grades. Each grade accepts various degrees of imperfection in the structure of the comic: defects of the spine, creases and tears on the cover, the whiteness of the pages and gloss of the cover among others are taken into account to come to the grade. Traditional pricing by dealers place a Fine (Good) copy roughly at 25% (10%) the price of a Near Mint copy.

4.2.2 – Certification in the Comic Book Marketplace:

Due to the impact of grade on pricing, it is crucial to ascertain the exact condition of a book before purchase. This is the gap that the Comics Guaranty intends to bridge. Certification agencies, governmental or private, are commonplace in many industries. One can find many examples of laboratories in markets for industrial products. In financial markets, auditors, bond-rating agencies, investment banks and underwriters evaluate

companies for the benefit of the investment community. The CGC plays this role in the comic book marketplace.

While the coin and the baseball card markets have benefited from certification for many years, the certifying third party only entered the comic book marketplace in 1999. The management of the CGC views their services as valuable to the comic book collecting community for several reasons. First, certification of books is helpful for insurance purposes since valuation depends on a large part on identification and grading of the comics. Second, it will eliminate a burden for collectors who can rely on the CGC for accurate and fair grading. Of particular relevance is the certification of comics sold over the Internet. The certification provided by a third party should eliminate the fear that bidders might have to receive an item not living up to their expectation. While a simple scan of a comic book can help alleviate such concerns, there is much that a scanned image can dissimulate or fail to reveal, in particular any restoration work that decreases the comic book value.

Despite this logic, a number of market participants have doubted the CGC's benefits. First, collectors fear that stamping a comic with a certified grade will attract speculators into the marketplace who will send prices spiraling upward and then the marketplace will crash. Second, collectors regret that, in addition to providing a grade to the book, the CGC encapsulates (or "slabs" in market terms) the book in a casing. If the casing is opened, the grade is no longer valid and the book must be resubmitted to the CGC for re-grading. Collectors' complaints about the slabbing practice reveal their intent of resale of the comic book, indicating a private values system. Third, investors fear that there will not be consistency in the grading by the CGC. Accurate grading is important and the CGC must guarantee consistency to achieve respectability. Finally, and closely associated with the previous concern, is the fear of softening grading standards over the years by the CGC. Such degradation would change the market's price dynamics and affect the value of individual collector's collection and dealers' inventory.

Perhaps because of these concerns, CGC's recent entry into the marketplace, or the cost (see Table 4.1 for the certification's cost structure), we observe that not all sellers take advantage of the certification service. In my sample, only 30% of all books offered for sales are certified. Sellers of low quality books might feel there is little to be gained from certification. However, even a high quality seller may not certify his books since there are alternatives. In their study of ISO certification, Anderson, Daly and Johnson (1999) list many reasons for foregoing certification. If the seller has established a strong relationship with the buyers, if the sellers provide warranty provisions, if the seller has a high reputation or if the cost of certification is too high, then the seller might consider not certifying his products. All these reasons would appear to apply to the eBay marketplace. Sellers can rely on repeat sales from the same bidders, offer full refund after the item has been received and evaluated by the buyer, or rely on the Feedback Rating he has established on the eBay system. eBay's Feedback Rating provides researchers with an excellent measure of reputational stock, often cited as an alternative to certification. In addition, they may deem the cost of the certification prohibitive for the benefit they can derive.

It is therefore interesting to focus on the impact of certification on price. Do certified comics receive a premium? Does the seller recover the certification cost? These are some of the questions that I intend to answer. However, before I can directly address these questions, I need to closely analyze and understand the origin of the sale prices realized in the context of the auctions from which I collect the sample. The following section provides an overview of eBay's business and auctions structures and of on-line auctions' research and develops hypotheses.

4.3 – On-line Auctions Structure and Research, Information Asymmetry Research and Hypotheses:

4.3.1 – Description of eBay Auctions²⁷:

While eBay has captured the headlines of many newspapers and financial publications, it is still necessary to describe the business format followed by this successful website and the structure of the auctions it runs. The on-line auction marketplace is clearly divided between the customer-to-customer and the business-to-business markets. EBay is by far the dominant player in the on-line customer-to-customer auction marketplace. According to David Lucking-Reiley (2000), eBay's revenues for August 1998 were \$70 million, with the closest competitors registering only \$5 million. EBay's revenues jumped to \$190 million by the following summer, ten times as large as the next competitor, Yahoo!. On March 19, 2001, eBay reached a milestone when it saw its ½-billionth auction being listed. EBay allows millions of individuals to post their goods for sale on the website and has become an important resource for many collectors.

EBay's auctions, due to their fixed length and the introduction of "proxy bidding", are best described as Vickrey second-price sealed-bid auctions. Sellers structure the format of each auction they list by deciding on the following characteristics:

Minimum Bid and Reserve Price: the minimum bid is the public reserve the seller has for the item. Any bid of a value less than the minimum bid will not be considered a valid bid. This minimum bid is known while the seller can add a secret reserve bid on the auction. A message indicates that there is a reserve for this auction. If the bids have not yet exceeded the secret reserve, the message reads: "Reserve not yet met" and changes to "Reserve met" once the current winning bid is above the reserve. Auction listing fees depend primarily on the minimum bid then additional charges are assumed based on additional features selected such as the secret reserve and other advertising costs for the auction.

²⁷ This section is in large part indebted to David Lucking-Reiley's article, who clearly lays out the institutional workings of on-line auction sites.

Length and Timing of the auction: eBay runs fixed term auctions but lets the seller determine the length of the auction, ranging from 3, 5, 7 or 10 days, and the timing of the start of the auction. Therefore, sellers set the hour and the day of the week on which the auction will end.

Settling the transaction: the seller also provides information as to which payment types she will accept once the winning bid is determined. Most accept money order, personal checks and some also accept credit card payment. In addition, the matter of the shipping cost and insurance cost, if available or requested, must be settled. Generally auctioneers include this information in the item posting.

Scan: Another auction characteristic is the provision of a scanned image of the object for sale. For comic books, it is common to include a scan of the front cover of the comic book as well as the back cover. Some sellers provide additional shots of the inside page quality and scan of spine details or of cover corners.

4.3.2 – On-line Auctions Research:

Several studies have investigated the impact of these choices on the final winning bid received on eBay. Whereas the pricing impact of the auction's structure is not my primary interest, I must control for its influence. Tables 4.2 and 4.3 summarize the literature's samples and results.

One key element for this research, and one for which eBay has been commended, is the Feedback Rating system. Every member of the eBay community is associated with a Feedback Rating. It consists of the difference between a member's positive ratings and negative ratings. After each completed transaction, each party is prompted to leave a feedback on the counter-party. The feedback can be positive, neutral or negative. One would therefore feel more confident in bidding on an item listed by a highly rated seller than by an untested individual. Any individual with an overall rating of -4 is banned from the community. This system has been adopted by many of eBay's competitors.

Researchers have investigated the impact of reputation using variations of the Feedback Rating. The evidence is overwhelming in showing that sellers' reputation has a great impact on both the number of bids attracted and the price generated by the auction.

Both high overall ratings and high positive feedbacks attract more and higher bids while negative feedback decreases both winning price and bids attracted. Interestingly, most find a disproportionate impact, whereby an additional negative feedback hurts an auctioneer more than an additional positive feedback helps.

Consequently, building and maintaining good reputation on eBay is beneficial for any seller. Keeping a high reputation, a seller attracts more bidders to her auction and enhances her revenue as the price paid for her item increases due to more competition in the auction and a greater confidence in her services. A fault of the research so far has been the neglect of alternative methods of informational asymmetry reduction. I complement the literature by presenting a comparison of the effectiveness of competing methods.

4.3.3 – Information Asymmetry Research:

In his seminal 1970 paper, Akerlof describes how markets can fail when quality is subject to uncertainty for the buyer. In such markets, the cost of dishonesty, above purchasers' loss, "must include the loss from driving legitimate business out of existence". To counteract the effects of quality uncertainty, Akerlof envisions three mechanisms: guarantees, brand names and licensing practices. The comic book marketplace on eBay makes use of each of these mechanisms, either in isolation or in conjunction. I elaborate on each of these in this section.

The literature²⁸ about guarantees or warranties is rich and we need to concentrate on the portion applicable to our setting. Warranties are needed when the quality of the product is not directly observable by the buyer. Generally, quality is revealed upon product failure. Our case is different in that the condition of the comic book is directly observable but the distance between the buyer and the seller precludes pre-sale examination of the comic book. Moreover, in many cases, the producer endogenously determines quality but, in this market,

quality is exogenous. Finally, warranties can differ in their terms and coverage, ranging from product replacement to partial refund to total money-back guarantee. Our product does not allow for replacement and the usual terms provide for total money-back guarantees. Consequently, we face a money-back guarantee on a product with directly observable exogenous quality. This setting is most similar in nature with Grossman's (1981) assumptions and he concludes, "Warranties seem like an incredibly useful device for getting around asymmetric information about product quality." Moreover, Spence's (1977) model in perfectly competitive markets with exogenous quality establishes warranties as powerful signals of quality and shows a positive relationship between warranty and quality.

Brand names or reputation have been an incentive to depict accurately and consistently product quality over time. Traditional analyses such as Allen (1984) show that "the future stream of profits from producing the high-quality good is usually greater than the one-shot cost savings from producing low quality." In our example terms, consistent accurate depiction of grade will in the long-run benefit the seller. Reputation²⁹ communicates attributes of seller's character to buyers who uses them to form expectations regarding product quality. Shapiro (1983) extols the value of such communication in helping buyers estimate current quality. He also shows that the seller will receive a premium to compensate her for the initial costs invested in building the reputation. Landon and Smith (1998) confirm that, in the Bordeaux red wine market, the "impact of reputation is approximately 20 times greater than the impact of current quality on price." Rogerson (1983) points out that reputation is only effective when buyers can share information costlessly. He also shows that if the recommendations are only positive and negative, there is an externality absent where actual estimates of quality are communicated. Dellarocas (2001) echoes Rogerson when he argues that the current metric used on eBay does not provide a clear measure of the

²⁸ I refer also for this paragraph to articles by Heal (1977) and Cooper and Ross (1985).

²⁹ I refer also for this paragraph to articles by Shapiro (1982) and Morris (1999).

transaction especially since it rates subjectively measurable attributes such as “quality of service” and “merchandise condition”. In other words, there are no assurances that all opinions refer to the same critical attributes and therefore it is difficult to calibrate one’s preferences based on the reputation variable and to assign accurately a specific level of trust to the transaction. Unless objectives measures of performance arrayed in a vector are communicated among buyers, the on-line feedback mechanism will fall short of its intended purpose, i.e., the Feedback Rating, even though useful, is not a perfect measure.

Licensing practices or certification generally attest of a minimum of quality level achieved. This is the case for example for degree-granting institutions or for professional qualifications. In our case, the certifying agent follows a full-disclosure policy and assigns a specific grade to the comic book. Certification allows sellers to alleviate most of the quality uncertainty and to overcome a lack of reputation thus providing the ability to compete with established sellers.

Payment policies can also provide a mechanism that alleviates problems caused by diverse quality as proposed by Emery and Nayar (1998). Sellers can communicate the quality of their product by delaying payment, which raises buyers’ expectations. If the seller allows for payment with credit card, then the comic book can be received and evaluated by the buyer prior to the actual payment of the charge. In many ways, this payment policy provides an implicit warranty. Consequently, one would assume that there are benefits to allow for such a payment policy. The next section revisits these concepts and develops hypotheses.

4.3.4 – Hypotheses:

Since, in the market we examine, sellers have recourse to all methods that reduce information asymmetries, we are able to measure their varying degrees of effectiveness. For example, after controlling for reputation and warranty, we want to know if CGC-graded

books generate higher prices than non-certified books of the same advertised grades. I ask the same question about reputation and warranty, leading to

Hypothesis 1:

- 1) Prices realized are higher for CGC-graded books than for similar non-certified graded books
- 2) Prices realized are higher when the seller offers a warranty than when she does not
- 3) Prices realized are higher when the seller has an established reputation than when she does not

Due to the formulation of the hypotheses, my analysis concentrates only on auctions that were successfully won and for which a market price is established. I approach the hypotheses two ways. First, for Hyp. 1-1, I create samples of matched auction results for which one grade is certified and the other is not while controlling for other auction characteristics relating to information asymmetry, namely warranty and reputation. A comparison of the mean prices realized in each matched samples indicates the presence of premium, if any, received by the book that has been certified. I replicate these steps for Hyp. 1-2 and 1-3. Second, I examine the relative influence of each method in a multivariate setting, thereby controlling for the other signaling mechanisms' influence.

In further tests, I investigate interaction across techniques. With the advent of a third-party grading agency, sellers may no longer need to build reputation in order to generate more bidding activity and higher revenues. Therefore, I expect a difference in reputation impact between certified and non-certified copies. The same should hold for warranty effects. Based on this observation, I formulate:

Hypothesis 2:

- 1) The reputation differential is higher for comic books without certification
- 2) The warranty differential is higher for comic books without certification

I test the validity of Hypothesis 2 in a parallel fashion to Hypothesis 1. For example, for Hyp. 2-2, I create samples of matched auction results for which one has a warranty while the other does not. I create these samples of matched auctions for both the certified and non-certified sub-samples. Then I compute the difference in the premium received due to warranty under the two (certified and non-certified) scenarios. The results are presented in Section 4.5. Before testing the hypotheses, I describe the sample in the next section.

4.4 – Sample:

4.4.1 – Sample Construction:

Several mainstream on-line auction sites offer comic books categories. The eBay system offers the best laboratory for this research. First, it has been the focus of prior research and therefore allows cross-studies comparisons. Second, it attracts many more auctions. In a check of eBay's comic books auctions in progress on March 3rd, 2002, I find 14,092 auctions for Silver Age (1956-69) comic books while Amazon carried 2,674 and Yahoo! only supported 599 similar auctions. In addition, less than 1% of eBay's competitors' auctions are for certified books while they account for 2.5%³⁰ of eBay's listings. The Comics Buyer's Guide, a weekly comic book collecting newsletter, reports that certified comic books have gradually penetrated the marketplace. For certified comics in grades of at least Fine, the auction volume on eBay has increased from 735 in September 2000 to 3,841 in April 2001 and more recently to 4,998 in November 2001. Due to the presence of numerous certified and non-certified comic books for sale on the eBay system, I collect information only on some specific comics issues. Sampling January 2001's auctions, I identified 30 Silver Age books frequently listed and frequently CGC-graded. Subsequently, I have kept

track of all sales of these issues on eBay for auctions ending between January 12, 2001 and June 23, 2001 accumulating a sample of 4,012 auctions. Of these auctions, 2,484 resulted in a sale. This represents a 62% sell-through rate, which generated revenues of \$977,657.35.

4.4.2 - Variables Definition:

To test the hypotheses developed in Section 4.3, I collect many auction characteristics as described in Section 4.3.1. In particular, I record the auction's minimum bid (First) and final bid (Price), the duration of the auction (Length), the presence of a reserve price (Res) and if the auction concluded in a transaction (Sold).

Then, I record all the pertinent information about information asymmetry removal. I record the Feedback Rating (Rep), the number of unique positive (Pos), unique neutral (Neut) and negative (Neg) recommendations received by each seller. In addition, I record with dummy variables the availability of payment with a credit card (CC), the offer of an explicit warranty (War), the inclusion of at least one scan (Pic) and the certification of the comic book (CGC).

Finally, I record the comic book identity (Name) and its grade (Grade), provided by the seller or provided on the CGC certificate.

4.4.3 – Sample Description:

Table 4.4 presents sample statistics for all books and then for the top 10 selling books. Panel A shows the number of books sold per issue with the corresponding median sale price and the median grade. A synopsis of generally accepted grading criteria is presented in Table 4.5. Panel B shows that Fantastic Four 48 was both offered for auction and sold the most often with 298 and 176 copies, respectively. The sell-through rates can be

³⁰ This percentage is not directly comparable to the 30% mentioned earlier reflecting the percentage of certified comic books in my sample since I restricted my attention specifically to the books that are the

as high as 82% but hover around the whole sample rate of 62%. The sub-sample of completed sales contains one third of certified copies and two thirds of non-certified copies and the seller offers an explicit warranty in 16% of the auctions. Panel C reveals that realized price means strongly exceed price medians and that standard deviations are high, reflecting substantial variation in prices. The median grade for the books sold ranges from Very Good + (VG+) to Fine / Very Fine (FN/VF) and the grades have a standard deviation of 2.5 on a 10-point scale.

Figures 4.1 and 4.2 display the grade distribution and the cumulative grade distribution, respectively, of the 2,484 comics that sold. Figure 4.2 indicates that certified copies in the sold sub-sample are stated to be in better condition. In fact, for books in grades of VF or higher, more certified copies are sold than non-certified copies even though overall there are 658 certified sold copies compared to the 1826 non-certified copies. Moreover, this pattern is not driven by different sell-through rates. Sell-through rate patterns are similar for certified and non-certified books. Sell-through rates seen in Figure 4.3 steadily decline from the 70-80% range for low grade copies to 50% for VF to NM- copies at which point the sell-through rates jump up. Two phenomena drive this sell-through pattern. First, there are different types of collectors in the marketplace. Some are not condition-conscious and prefer buying reading copies, i.e., copies in lower grades up to Fine condition. Other individuals are more grade-sensitive and invest in the high-end of the market and prefer to obtain the best copy available and only buy copies with a grade greater than VF/NM. Consequently, books in the intermediate grades do not sell through as well. The second phenomenon driving the sell-through pattern is the increasing occurrence of a reserve price across grades. The percentage of reserve auctions seen in Figure 4.4 increases from 15% for grades less than G, to 30% for grades from VG/FN to FN, to 40% for grades between VF and VF/NM and reach values greater than 50% for the highest possible grades.

most frequently certified.

Finally, in Figure 4.1, we notice that non-certified copies avoid half grades. Sellers are more likely to assign full grades such as G/VG, VG or FN rather than split grades such as G+, VG- or FN-. Two explanations are possible. First, the avoidance reveals sellers' low grading skills or, second, sellers round up the condition of the item they auction to boost revenues.

Having both defined hypotheses and described the sample, I now turn to the results.

4.5 – Results:

4.5.1 – Univariate Analysis:

First, I will test Hypothesis 1. The process to test each of the sub-hypothesis is similar and the results are presented in Tables 4.6, 4.7 and 4.8. For each hypothesis, I create pairs of observations, directly controlling for the influence of the competing methods of relieving information asymmetry not central to the hypothesis. For example, in Table 4.6, I concentrate on the impact of certification. Accordingly, I find pairs of auctions for the same book in the same grade that have the same warranty characteristic. In addition, I only include sellers with the same reputation characteristics. I differentiate reputation along two dimensions. First, I separate sellers in three groups by their number of positive recommendations³¹. Figure 4.5 illustrates the groups' definition. If the natural logarithm (log) of the number of unique positive recommendations received by the seller exceeds 6, it belongs to the high reputation group: $R = 3$. If the logarithm is between 4 and 6, the seller falls into the average reputation group ($R = 2$) and if the logarithm is below 4, the reputation is deemed low ($R = 1$). Second, I define a dummy variable that indicates if the reputation is spotless, i.e., if the seller has never received a negative recommendation or not. I call the

³¹ Alternate groupings were used and yielded similar results. I used quintiles or relied on eBay's systems of star ratings. Sellers with a feedback rating lower than 10 receive no star, sellers with a feedback rating between 10 and 10,000 receive different colors stars and sellers with a feedback rating in excess of 10,000 receive shooting stars.

dummy variable HasNeg and it takes the value of 1 if there is at least one negative feedback associated with the seller and 0 otherwise. The combination of these two aspects of reputation yields six categories and combined with the two warranty categories, the 30 different books and the 25 potential grades, it follows that any book can fall in one of 9,000 categories. I then identify the categories that have at least one successful auction for both a certified and a non-certified comic book. I find 174 such categories. I then define the premium that reflects the dollar price difference between the certified and the non-certified copies scaled by the average market assessment of the comic book value. I compute the variable as follows:

$$\text{Premium} = \frac{\text{Certified Book Price} - \text{Non - Certified Book Price}}{\frac{\text{Certified Book Price} + \text{Non - Certified Book Price}}{2}}$$

In the table, I record mean Premium, its mean significance based on a t-test of difference from zero, the percentage of times it is positive and the number of observations I find. The certification effect is highly significant and on average a certified copy sells for 43% more of the average market price than a non-certified copy. The premium is positive for 154 of the 174 pairs or 89% of the times, which is significantly different from 50%. The premium paid for the certified copy is increasing with the grade. Hypothesis 1-1 is confirmed.

The evidence in Table 4.7 however does not confirm the next hypothesis. There is no evidence that providing an explicit warranty, everything else constant, raises the price. The result is consistent across all grades.

When testing Hyp. 1-3 about reputation, I examine in turn the impact of having established a reputation and the cleanliness of the reputation. In panel A of Table 4.8, I separate books that have similar warranty, certification, and HasNeg value. Within these groups, I find pairs of books from sellers in different R reputation categories. I find 89 categories for which there has been at least one successful auction led by a high (R = 3)

reputation seller and a low ($R = 1$) reputation seller. I find 157 categories when comparing sellers with high ($R = 3$) reputation with seller of average ($R = 2$) reputation. In neither case is there evidence that having built a high reputation on the eBay system yields a price premium. Moreover, there is no statistical difference³² between the impact from high to low reputation and the impact from high to average reputation.

Panel B addresses the impact due to the presence or absence of negative recommendations in the Feedback Rating of sellers. The matching procedure computes the mean premium received by a seller without any negative feedback over a seller of similar reputation group selling a book with similar warranty and certification characteristics but who has received at least one negative recommendation. Again, there is no evidence of a significant premium received from keeping a clean reputation record.

There are several possible explanations for the insignificance of reputation. First, it is possible that the influence of the certification dominates. Some of the matched pairs are certified while others are not. For the certified pairs, if the certification effect dominates then there is no benefit to reputation beyond certification and the inclusion of such pairs would bias down the statistics even though there can be benefits to reputation in the absence of certification. To this extent, testing Hypothesis 2-1 would reveal such an effect since we are differentiating between certified and non-certified pairs.

Table 4.9 presents results of testing Hypothesis 2. In Panel A, results seem to indicate that there is a difference in the reputation impact across certified and non-certified comic books and that the direction of the impact is opposite the intuitive direction specified in Hyp. 2-1. However, the appropriate test is based on matching similar pairs of books with similar reputation and different certification characteristics. Unfortunately, there are no such matches when we differentiate reputation using R . Using HasNeg as our differentiating

³² There are 78 categories for which there is a match for both the high-low and the high-average pair. The difference in the respective impact is -0.00815 or -0.8% with a p-value for the test of difference

measure of reputation, there are 30 matches for which there exist a pair of books for the same issue, within the same R-reputation group and one has at least one negative recommendation while the other has none, for each certified and non-certified categories. The difference of impact of reputation between these groups is -0.0403 or -4.03% with a p-value for a t-test of difference to 0 of 0.6453 implying that the impact of maintaining a clean reputation is not larger when the book has not been certified than when the book has been certified.

In Panel C, I report statistics pertinent to Hyp. 2-2 but, again, once I match across both CGC and non-CGC pairs, only 3 careful matches emerges. Analyzing these three pairs does not reveal any difference of impact of including a warranty between auctions of non-certified or certified similar comic books by sellers with similar reputation. The difference is -0.0405 or -4.05% and is statistically insignificant.

The analysis of Table 4.9 suggests another explanation for the lack of expected significance of reputation on auction results: the coarseness of the matching. We could have not differentiated reputation enough in the matching process and be missing the impact due to the specification. To palliate this shortcoming of the univariate analysis, I turn to a multivariate approach that allows for better discrimination of the influence of each factor.

4.5.2 – Multivariate Analysis:

To harness the most information from the data, I turn to a multivariate analysis of the results. The previous section suffered from two shortcomings. First, while the sample contains 2,377³³ successful sales, I was only able to rely on several hundred observations in the univariate analysis and therefore was excluding valuable information from the results. Second, notwithstanding the extensive and careful matching process followed in Tables 4.6,

from 0 of 0.8307.

³³ The difference between 2,484 and 2,377 is accounted by comic books that have been restored to increase their grade for which the pricing dynamics are different and therefore eliminated from the analysis.

4.7, 4.8 and 4.9, I was not able to control for the presence of a secret reserve price or the availability of payment with a credit card or the inclusion of a scan in the auction listing, parameters we have established might influence prices.

In the multivariate analysis, I use the natural log of price as the dependent variable. The analysis, whose results are reported in Table 4.10, also allows for a better accounting³⁴ of reputation by introducing LnPos ($=\ln(1+\text{Pos})$) and LnNeg ($=\ln(1+\text{Neg})$) instead of the coarser measures used in the univariate analysis. Also, I include dummy variables to account for differences in grade (DFr – DNM/M) and comic book (DB1 – DB29) leaving out the grade of Poor and the book that sold the most often, Fantastic Four 48. In this more rigorous setting, we see that not only does certification significantly impact realized prices but so do reputation, warranty and the scan. Moreover, other variables bear their expected sign: a reserve and the possibility to pay with a credit card both increase the price and the presence of negative recommendations decreases the final price.

On average, certifying the comic book raises significantly the log of price by 42.4%, translating into a 52.8% price increase. Books sold with an auction with a secret reserve price generate an additional 7.6% in revenue. Similarly, warranties generate a significant premium of 3.5% and the inclusion of a picture in the auction listing significantly boosts the winning bid by 14.2%. The impact of the credit card payment is an insignificant positive 1.5%. The impact of positive reputation is such that an increase of 1% in $1+\text{Pos}$ increases price significantly by 1.3% while an increase of 1% in 1 plus the number of negative recommendations³⁵ decreases price by 1.0%. The results for reputation are in line with the results of previous studies tabulated in Table 4.3. Positive recommendations have a positive

³⁴ Alternate specifications were run with results of the same tenor. I ran the regressions with the dummy variable HasNeg instead of LnNeg . Also, I combined both measures of warranty, implicit and explicit: warranty and credit card with similar results.

³⁵ Let us recall that sellers generally have a much larger number of positive recommendations than negative recommendations and therefore it is much easier to contemplate an increase of 1% of negative recommendations than it is of positive recommendations.

and significant impact on price. Negative recommendations have a negative insignificant impact on price. Also, similar to prior research, secret reserves, payment by credit card and scans have a positive impact on prices.

Overall, these results are confirming all three parts of Hypothesis 1, i.e., there is a premium accruing to sellers that use any of the asymmetry removal mechanisms. However, there appears to be large differences in the economic impact of the various techniques. Before exploring this issue further, I turn again to the questions asked by Hypothesis 2, namely the potential differential impact of the techniques between the certified and the non-certified sub-samples. I use interaction variables to test the hypotheses directly. These results are reported in Table 4.11.

The main result from Table 4.11 is that none of the interactive variables are significant, implying that there is no statistical proof for either Hyp. 2-1 or Hyp. 2-2. Most interactive coefficients have the expected sign. For example, the negative impact of negative recommendations is counteracted in the CGC sub-sample. Similarly, warranties, scans and credit card payment effects are indicated to be smaller in the CGC sub-sample. However, the coefficient on the interaction between LnPos and CGC is positive, though insignificant, indicating a potential reinforcement of the signals from certification and reputation. Another interesting possible interaction between the removal mechanisms is the credibility of the warranty. For sellers with low reputation, it is possible that the warranty offered is not credible and therefore accrues less value to the buyer than a warranty offered by a reputable seller would. In a separate analysis, I run another ordinary least square regression of log of price on a similar set of dependent variables including interactive terms between War and R1 and between War and R3. R1 (R3) is a dummy variable defined such that R1 (R3) equals one when the seller's reputation falls in the R = 1 or low (R = 3 or high) reputation category as shown in Figure 4.5 and used in the univariate analysis. The coefficient on the interaction between War and R1 is negative and significant indicating not only that there is no benefits in

offering a warranty if you have not established a reputation, but actually, the impact overall is negative on the price realized. The inclusion of the warranty acts as a negative signal about the quality of the comic book reducing, everything else constant, the price by 6.4%.

In a final analysis, I turn to a Tobit analysis in order to harness the most out the information incorporated in the sample.

4.5.3 – Tobit Analysis:

In the full sample, not all auctions result in a sale for two reasons. First, auctions can receive no bid in which case we only observe the minimum bid (First). The data is left censored and we face a variable known threshold. This happens for 789 of the total 4,012 auctions. Second, auctions receiving bids need not result in a sale if the highest bid does not meet the secret reserve price if one is imposed. This scenario occurs in 739 of the 3,223 auctions receiving at least one bid, 1,236 of which have a secret reserve imposed. Once again, this data is left censored since the market does not clear and we face a variable unknown threshold. The balance represents the 2,484 auctions ending in a transaction.

In keeping with prior studies, I extract information from the entire sample using a Tobit analysis. In this section, I redefine price not to mean the actual money exchanged between parties but the highest recorded bid becomes “price” and represents bidders’ willingness to pay. Therefore the censoring process is driven only by variable known thresholds, namely, the minimum bids for each auction not receiving any bids, which we can model as:

$$\begin{cases} y_i = X_i\beta + \varepsilon_i & \text{if } y_i > \tau_i \\ y_i = \tau_i & \text{if } y_i \leq \tau_i \end{cases}$$

where τ_i equals the minimum bid. The Tobit method then ensures unbiased and consistent estimates by maximizing the likelihood function and β , the vector of parameters, reflects the willingness to pay impact for each of the dependent variables.

Before proceeding with the analysis, we examine the characteristics of the auctions censored and compare them with those of auctions not censored under our model. On the one hand, the 789 auctions censored are for a book in a median grade of FN with a median minimum bid of \$175, certified a quarter of the time and auctioned by a seller with median feedback rating of 317. On the other hand, for the auctions that attracted at least one bid, the book has a median grade of VG/FN with an opening bid of \$15, is certified 30 percent of the time and the median feedback rating of the seller is 185. The striking difference between the two samples is the much larger minimum bid imposed on the censored auctions. Sellers of the censored auctions prefer the strategy of starting the auctions high to either that of starting the auction low and attracting bidding activity or that of relying on a secret instead of a public reserve price for the item. Indeed, only 4% of the 789 no-bid auctions have a secret reserve price while 37% of all other auctions impose a secret reserve.

The results from the Tobit analysis are reported in Table 4.12. I incorporate the same dependent variable as in Table 4.9 to allow comparison of the results. The coefficients on the CGC, Scan and CC dummy variables are similar to those in Table 4.9. While Res was significantly positive in the regression of price for the sold sub-sample, the willingness to pay is negatively, even though insignificantly, influenced by the presence of a secret reserve. This is not surprising since a secret reserve might deter bidding as it reduces the chance of success with unchanged bidding costs. However, conditional on the auctions being successful, a secret reserve significantly raises the realized price. In the Tobit analysis, both reputation measures significantly impact the price bidders are willing to pay. A 1% increase in log of 1 + positive recommendations significantly increases price by 0.9% whereas a 1%

increase in log of 1 + negative recommendations significantly decreases price by 1.6%. Similar to prior studies, the impact of negative recommendations is almost twice that of positive recommendations. To discern if sellers can improve their reputation after receiving negative recommendations, I reproduce the results substituting LnNeg with LnRecNeg and LnOldNeg, where $\text{LnRecNeg} = \log(1 + \text{Negative recommendations received within the last 6 months})$ and $\text{LnOldNeg} = \text{LnNeg} - \text{LnRecNeg}$. The coefficient on LnRecNeg is statistically significant and an increase of 1% in recent negative comments decreases price by 2.1%. The impact is greater but the balance, i.e., the impact of older negative recommendations, has no significant impact on prices, implying that the reputation, once tarnished, is not significantly expunged over time. A seller's current reputation is not more important than the total history of reputation. Whereas warranties were improving the price realized for successful auctions, they are not significantly increasing bidders' willingness to pay.

Overall, the results are consistent with our expectations and in line with prior research's results. Having examined the influence of the various auction characteristics and asymmetry removal mechanisms on both realized prices and willingness to pay, I turn to other issues relative to the certification process and to pricing in the comic book marketplace.

4.6 – Certification Decision and Price Guide Accuracy:

4.6.1 – Certification Decision:

Results in Table 4.10 allow for a deeper look into the certification decision faced by sellers. Before expending the cost of certification, a seller must ask himself the following questions. At which approximate grade is it economically advantageous for me to have this comic book certified? Or alternatively, for a book in FN, what is the minimum value for which it is economically advantageous to certify a comic book?

The previous analyses yielded the premium received from certifying a comic book. On average, the selling price is at a 52.8% premium over a similar non-CGC graded comic book.

This information would be enough to answer the questions asked above. However, it is possible that the premium varies through grades. Checking if the CGC premium varies across grades, I repeat the analysis of Table 4.10, defining two new dummy variables: *DltVG* and *DgtVF* which take the value of 1 if the grade is less than VG and the value of 1 if the grade is greater than VF respectively. I have thus segregated the CGC premium for what I call low grades (less than VG), mid-grades (VG to VF) and high grades (greater than VF). The CGC premium is significantly different across these categories. Certification in low grades significantly increases prices by 7.7%. In mid-grades, certification boosts prices by 38.1% while high grades receive a 79.5% certification premium.

To answer the seller's questions, we need to have an estimate of the value of the comic book in various grades. I decide to use the value assigned to each comic book in the 2000 and 2001 editions of the Overstreet Comic Book Price Guide³⁶. The Price Guide reports for every book in the sample a guide value for each of the Good, Fine and Near Mint grades. Using the percentage premium above, I compare the dollar premium received based on the Price Guide value to the discounted³⁷ certification cost for the lowest possible level of certification service. I establish that certification would be economically profitable when the premium exceeds the certification cost. For example, the Price Guide value for *Amazing Fantasy 15* is \$1,167 in Good. The value implies it would only qualify for the Express or Walk-Thru level of service and the minimum discounted cost is \$44. The expected premium of 7.7% amounts to \$90 that makes it an economical to certify even at this grade. Alternatively, for this level of service, Express, for a comic book in Good, the cost is \$44 and the minimum Price Guide value that would warrant certifying the comic book is therefore

³⁶ The "new" Price Guide is issued in mid-April of every year and two different editions of the Price Guide therefore cover the sample. I use April 15th as the date at which the prevailing book value switches from the 2000 (30th) edition to the 2001 (31st) edition of the Price Guide.

³⁷ I assume here that the seller submit the comic book to the certifying agent via their network of preferred dealers and thus the seller obtain the service at the cheaper discounted price.

\$44 / 0.077, that is \$572 confirming again that the Amazing Fantasy 15 could profitably be certified. A synopsis of similar analyses is shown in Table 4.13.

As seen in Panel A, certification would be economically attractive for few books in Good condition even in our sample of highly collectible books. Only 8 comic books would warrant certifying. However, once we move to higher grades, certification is attractive for most comic books. All but one would be profitably certified in Fine condition and all would benefit from certification in Near Mint. Panel B records the threshold Price Guide values that determine profitable certification per grade and service level.

A more interesting question is determining if sellers in the sample took adequately advantage of the availability of certification. First, for CGC-graded books, I determine if the books have been justifiably certified. Second, for the non-certified books, I determine if it would have been economically advantageous to obtain certification.

Concentrating only on books that sold, I first want to determine if the premium paid for certified books justified the lowest possible certification cost. To distinguish better across grades, I determine in an unreported regression analysis the certification premium for all grades instead of relying on the premium for low, mid and high grades. Moreover, since the price observed already includes the certification premium, we have to estimate a base value with which to compute the certification premium. To establish this expected value, we compute the average ratio of realized price to the Near Mint Price Guide value for each grade. The estimated value of the comic book is then its Near Mint value times its grade average ratio to Near Mint. Based on this expected value, we determine its expected certification premium by multiplying its expected value by its grade certification premium. Finally, we compare this certification premium to the minimum discounted certification cost. If the premium exceeds the certification cost, we deem the comic book justifiably certified and if the premium is lower than the minimum certification cost, we deem the comic book was

erroneously certified. Out of the 579 certified comic books sold in the sample, 482³⁸ were justifiably certified. In other words, certification paid off 83% of the time.

Second, for the comic books that sold without receiving certification, we need to compare again the expected certification premium to the minimum certification cost. In this case, we base the expected certification premium on the actual realized price of the auction. Then, the expected certification premium is simply the price realized times the certification premium for the grade. Comparing this expected premium to the minimum certification cost attainable, certification would have been economically justifiable for only 555 of the 1,798 non-certified comic books that sold in the sample. Only 31% of the non-certified comic books in the sample would have benefited from certification in the sold sub-sample³⁹.

Overall market participants certified comic books in only 482 of the 1,037 cases for which certification would be justifiable, or 46% of the time. Conversely, they have wrongly certified comic books only 97 times out of the 1,340 cases for which we estimate certification was not economically profitable, or only 7% of the times. While market participants do not take full advantage of the benefits of certification, they appear rational in generally not seeking certification when it is not economically justifiable.

4.6.2 –Price Guide Accuracy:

Prior research has raised concerns about the impact of a price guide in any collectible marketplace. The introduction of a price guide is a sign of a broad market. Moreover, Stoller (1984) indicates that price guides are beneficial and impact the level, variability and

³⁸ If we were to include an additional \$7 for Priority shipping to and back from the CGC offices, the numbers of justifiably certified comic books only drops from 482 to 473. That is, the additional shipping costs associated with the certification process would change the certification decision for only 9 comic books. These costs can be overlooked in this analysis.

³⁹ It is possible that sellers not taking advantage of certification might rely on an established reputation to diminish uncertainty about the book's grade. However, the mean (median) feedback rating for sellers not certifying when we expect certification to be advantageous is 420 (160) while the mean (median) feedback rating for sellers foregoing certification when we anticipate it would not be

uniformity of prices. However, they may also serve as an instrument for market manipulation, whereby prices are arbitrarily driven up. Stoller recounts interviews during which he discovered that a stamp price guide values were so high that many dealers charged fifty percent less than the guide's prices. Similarly, Lucking-Reiley et al (2000) find that, "in general, U.S. Cents seem to be selling on eBay for 60% of their book value". The comic book marketplace relies heavily on the information provided in the Price Guide. Our data allows us to test if the guide valuations are in line with actual recorded transactions. The results discussed hereafter are reported in Table 4.14.

In Panel A, we present the overall comparison of actual realized auction prices to price guide values for each comic book in the sample. For each of the three grades (Good, Fine and Near Mint) for which the Price Guide provides a value for every comic book, we compute the ratio of the realized prices for the grade to its value listed Price Guide and the p-value of a t-test of difference of this ratio to 1. We also report the percentage of times the Price Guide over-values the comic book in grade, its statistical difference to 50% and the percentage of times the comic books were certified. Finally, in the last column, I indicate if the book was under-, accurately- or over-valued based on the p-value of the test of the difference to one of the realized price to the Price Guide value. Overall, we see that 16 books were accurately valued in the Price Guide, 10 were over-valued, 2 were under-valued and we do not enough information for the remaining two books. At first glance, it appears that the performance of this Price Guide is better than anticipated in light of the conclusions of previous research.

Panel B allows us to more directly investigate the bias impounded in the Price Guide values. Over all 456 observations in the sample, the Price Guide performs very well since the ratio of realized prices to Price Guide values is 0.99, insignificantly different from 1 even

economically justifiable is 574 (221). The mean of 420 is significantly lower ($p=0.006$) than the mean of 574.

though the percentage of times the ratio is under one is significantly greater than 50%. Yet, observing the results across the three grades reveals an interesting pattern in which the Price Guide over-values the books in Good and particularly the books in Fine while it under-values the books in Near Mint. On one hand, books in Good condition sold for 90% of their Price Guide value while books in Fine sold for 78% of the Price Guide value. On the other hand, books in Near Mint sold for almost twice the value indicated in the Price Guide. A possible explanation for the over-pricing observed is that the Price Guide has introduced the results of certified comic book sales when computing the Price Guide values. It is possible that the sample we observe is mostly composed of non-certified comic book sales and therefore the results are lower than those for certified comic book sales, which we know receive a certification premium. Panel C addresses this possibility.

In the final Panel, we segregate certified from non-certified copies. Our presumption plays out for Good and Fine copies. Non-certified comic books are significantly over-valued in Good and Fine condition by 12% and 39% respectively, that is, they sell at a 12% and 28% discount respectively. Certified copies are accurately valued. The ratio of realized price to Price Guide value is not different from 1 and the percentage of copies sold for under the Price Guide value is not different from 50%. The pattern is reversed for books in Near Mint. Non-certified copies are accurately graded while certified copies are under-valued. These facts combine to show that the Price Guide on average over-values non-certified comic books and under-values certified comic books reflecting their combining sales from both types when computing the Price Guide values.

Overall, the price guide performs well in our tests and there is little evidence of consistent over-pricing. The existing over-pricing is partially explained by the inclusion of certified comic books' sales in the guide values.

4.7 – Conclusion:

When selling a product whose quality is uncertain, buyers must beware of the seller's character. For her benefit, the seller can resort to various mechanisms to reduce the level of information asymmetry. To convey a clearer measure of product quality, she can develop a reputation, extend a warranty or acquire certification for the product. Each of these alternatives will help the buyer to form better expectations about product's quality by developing trust in the seller's information. In this paper, we measure the relative benefit of these techniques as available to sellers in the on-line comic book marketplace.

We first determine that each of the techniques is valuable in its own right. All provide a significant premium in the price realized by the seller. Moreover, we show that their effects are additive. Indeed, a seller who has sought certification for his product will also derive additional benefit from his reputation. We also show that, if one has not built a reputation for honest dealing, no significant benefits accrue from attaching a warranty to one's sale listing. Credibility must be earned first before reinforcing one's reputation by offering a full money-back guarantee. These results are reflected in the policies of major corporations that use all forms of information removal techniques at the same time to promote their products.

We show that market participants are in general rational in their decision to certify their product as they forego the certification cost when the benefit they can expect to derive from the process do not exceed the certification costs. Similarly, we observe that market participants avoid receiving negative recommendations that impose penalties twice as large as rewards generated by a proportionate addition to positive recommendations.

Finally, we show that the comic book marketplace benefits from a Price Guide that represents accurately values as they are in the marketplace. Overall, there is only slight evidence of over-pricing in the Price Guide that we can partially explain from the computation method adopted. This market place performs better than others.

It would be interesting to transport these results to another market and confirm the insights we obtained from observing a market for which we are able to obtain a clear measure of all three asymmetry removal mechanisms, especially since the theoretical literature tends to concentrate at any time on any one or two of the methods but never on all at the same time or on their interaction.

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APPENDIX 3.A

The following messages disseminating whisper numbers have all been collected from the www.deja.com website. Deja.com provides an extensive collection of archived messages from newsgroups. To find messages referring about whisper, I entered a search using the words whisper and earnings. I reproduce here some representative messages of the population delivered by the search. All the messages shown below were posted on the misc.invest.stocks newsgroups. For more information about newsgroups in general and misc.invest.stocks in particular, please refer to Dewally (2001).

Example 1:

Subject: LSI down before earning?

Date: 07/23/2000

Author: Lousycook

Message:

stock was closed \$47.50 on Friday, has been down for a week, it reports earning next week, **whisper number is 29 cents.**

Example 2:

Subject: CSCO Might be OK

Date: 08/06/2000

Author: Xrayjuan

Message:

Analysts are expecting the growth of the Internet to fuel robust revenue and earnings when San Jose, Calif.-based Cisco reports its results after the close of regular trading on Tuesday. The current 33-analyst First Call/Thomson Financial estimate calls for 15 cents, while a **whisper number of 17 cents is floating about**, according to a number of observers. WhisperNumber.com, a Web site that tracks investors' earnings expectations, also puts the number at 17 cents.

A Saturday-morning Bloomberg story said analysts expect Cisco's net earnings, including acquisition costs, to fall to as low as 6.5 cents a share from the year-ago 9 cents. But analysts' operating earnings estimates don't include acquisition costs, and Bloomberg acknowledged that most analysts expect operating earnings to come in at least a penny higher than the 15-cent consensus.

Despite being knocked down to a low of just above 58 Thursday morning by meaningless earnings shortfall chatter and put options buying, the stock endured an impressive rebound along with the broader Nasdaq Comp. Cisco closed Thursday up 5.6% at 64 3/8, then tacked on a further 1 3/16 Friday to close at 65 9/16.

Example 3:

Subject: Ciena Corp. gets \$150 Target Price

Date: 02/15/2000

Author: Jack Taylor

Message:

In a recent news / message report at: www.go.com Reports of continued new contracts and opportunities for Ciena Corp, CIEN, has resulted in a new target price of \$150.00 per share. Ciena Corps. earning reports are due to be announced on February 17, 2000. **The whisper numbers say they have beat expectations by \$0.02 per share for the quarter.** I have also heard rumors of a possible, 2:1 split that would certainly make CIEN an extremely good buy for those wanting a fast ride to more profits.

I'm STRONG and LONG on CIEN!!!

Do your DD before ou [sic] buy please.

Appendix 3.B - Reproduction of the WhisperNumber.com interface for current and historical whisper information.

ORACLE CORP.

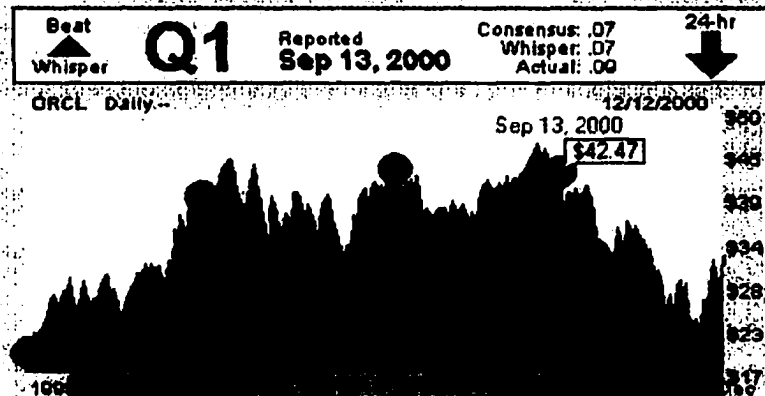
Earnings Snapshot

Next Earnings Report: December 14, 2000

Consensus Estimate:	\$0.10
Whisper Number:	\$0.11
Number of Whispers:	22

Enter Your Whisper:

Whisper Chart

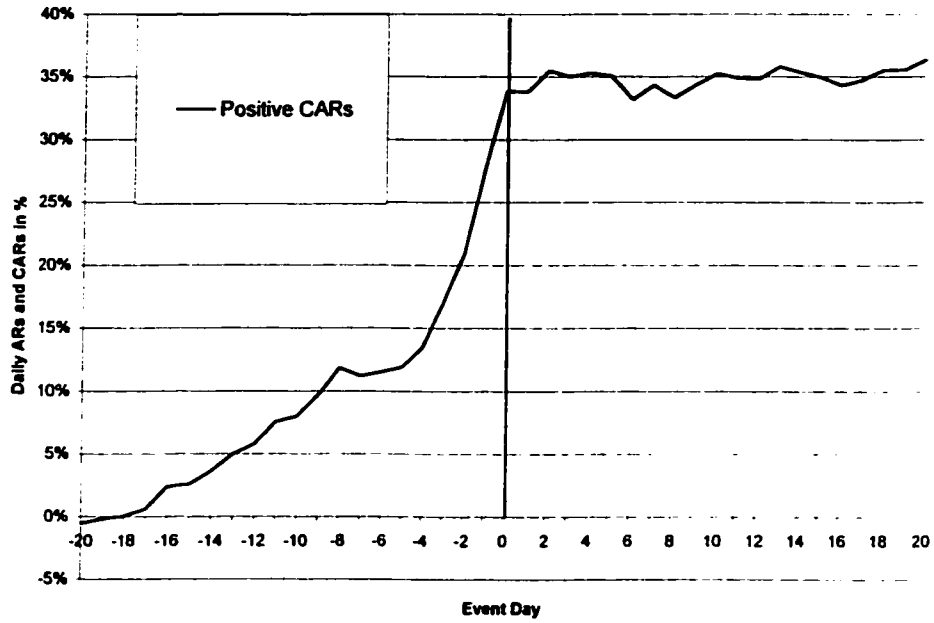


Select a year: 2000

FIGURE 2.1

The following graphs illustrate the market-adjusted returns accruing to all stocks positively recommended in both the up and the down markets.

UP MARKET



DOWN MARKET

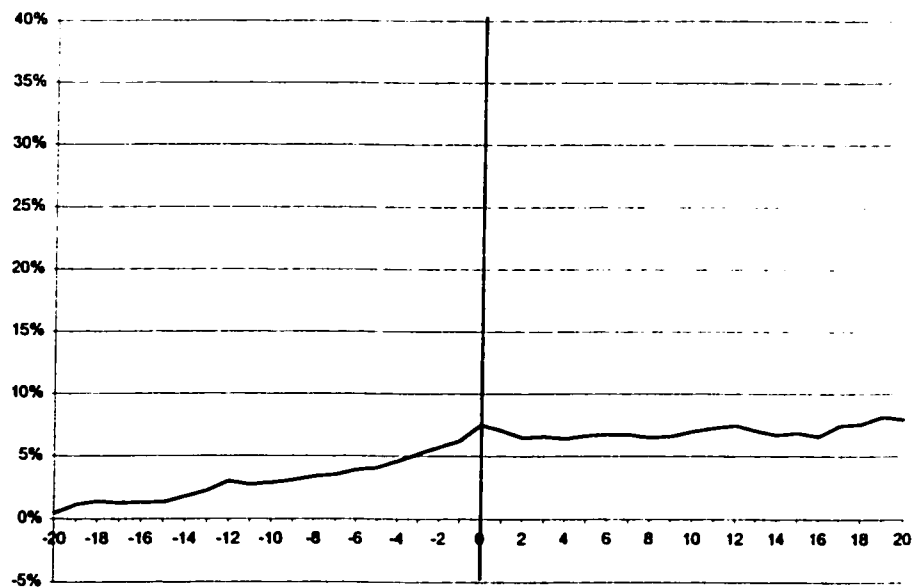


Figure 3.1
Consensus Forecast Errors and Whisper Forecasts Errors

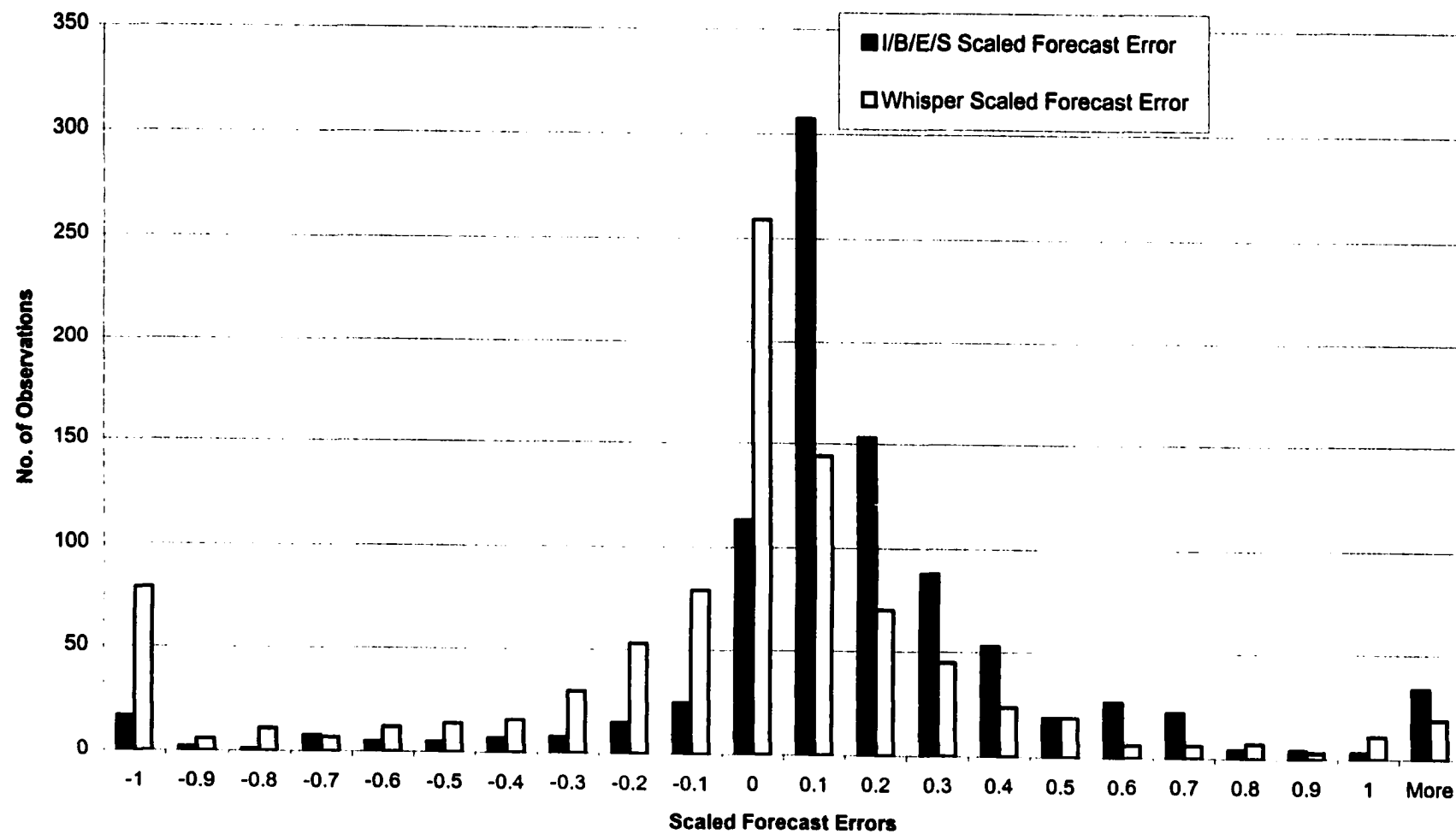


Figure 4.1 - Grade Distribution for Sold Certified and Non-Certified Comic Books

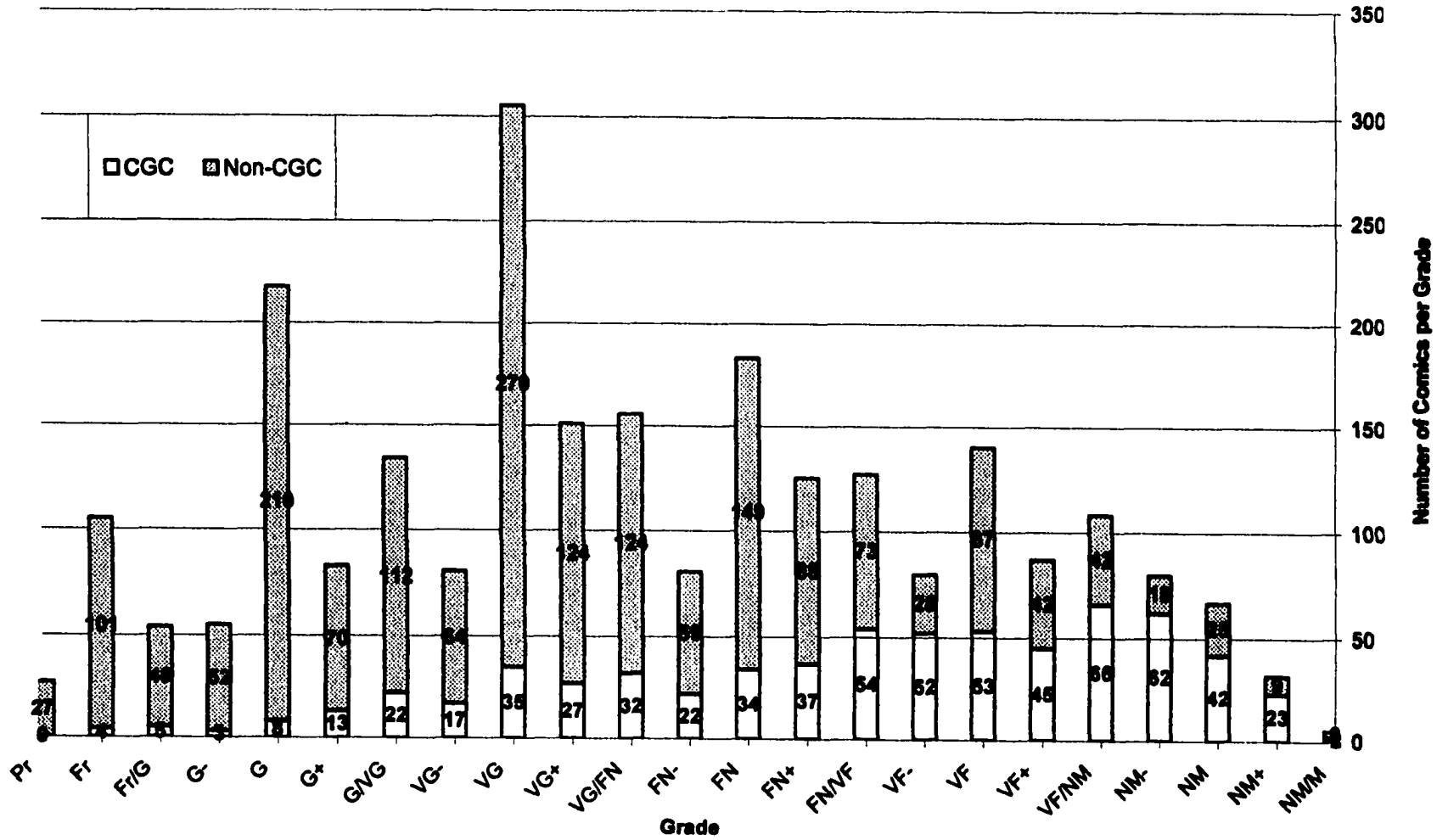


Figure 4.2 - Cumulative Grade Distribution for Sold Certified and Non-Certified Comic Books

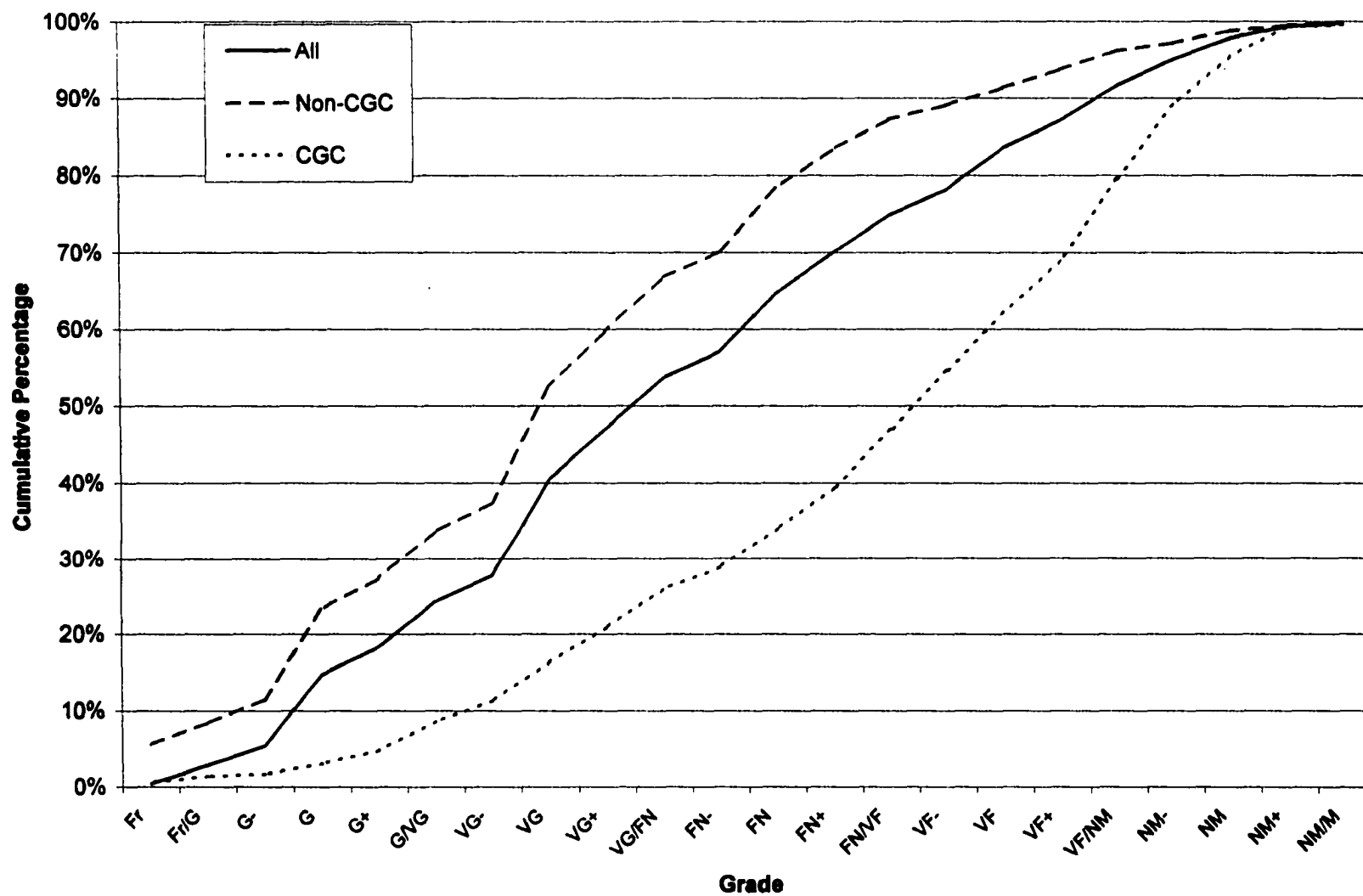


Figure 4.3 - Sell-Through Rates per grade

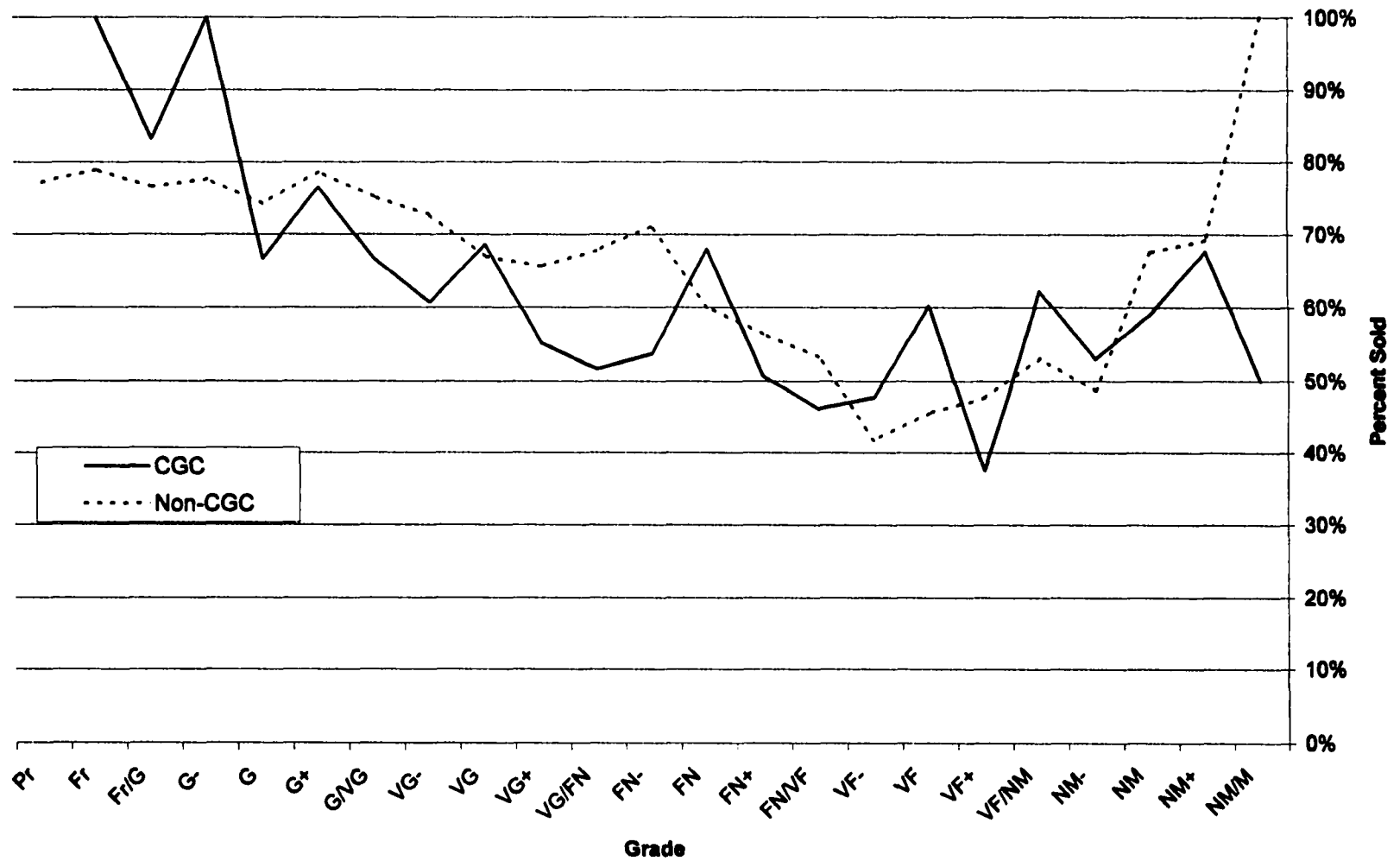


Figure 4.4 - Percentage of Reserve Auctions per Grade

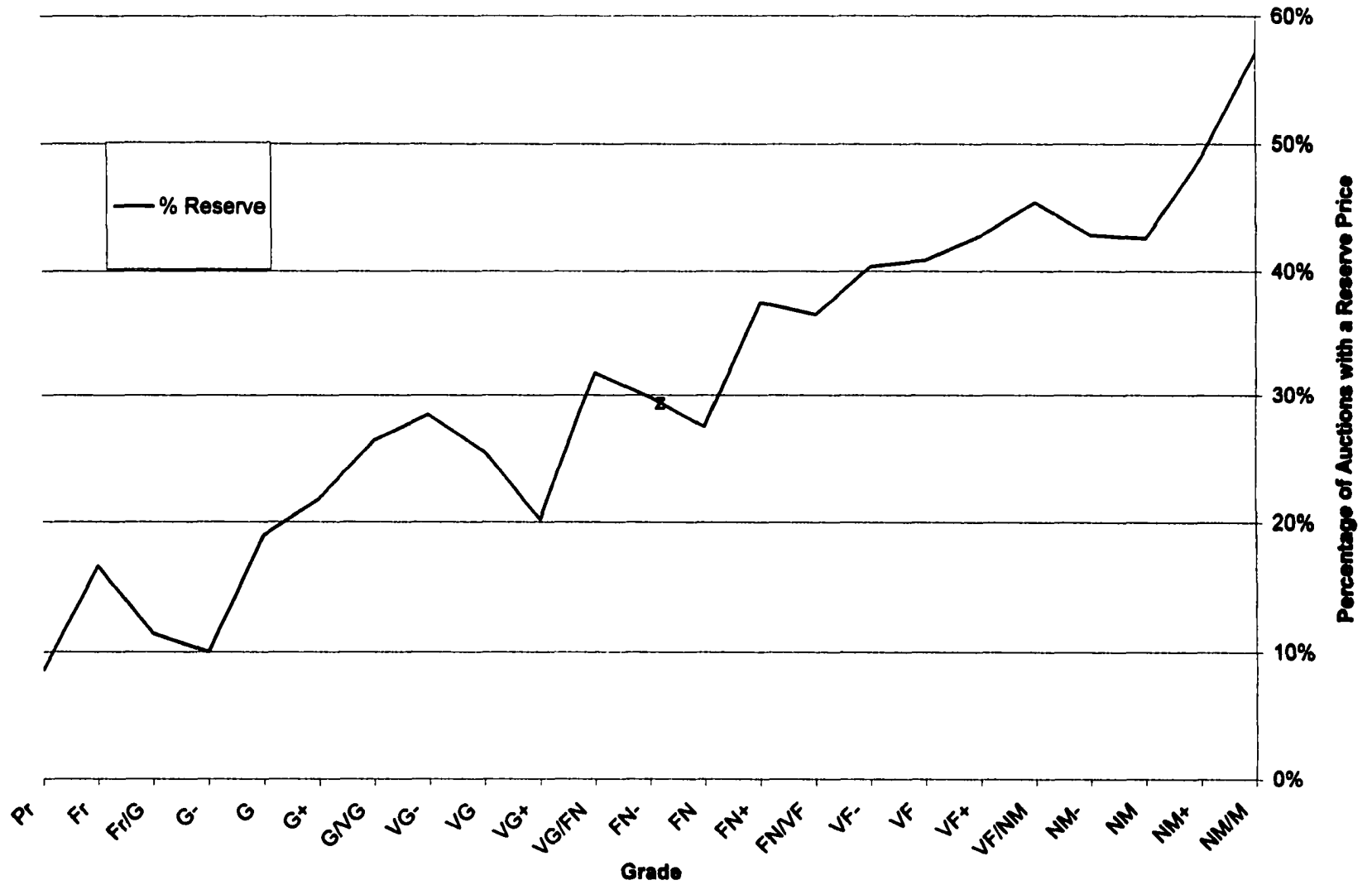


Figure 4.5 - Histogram of LnPos and R Groups Definition

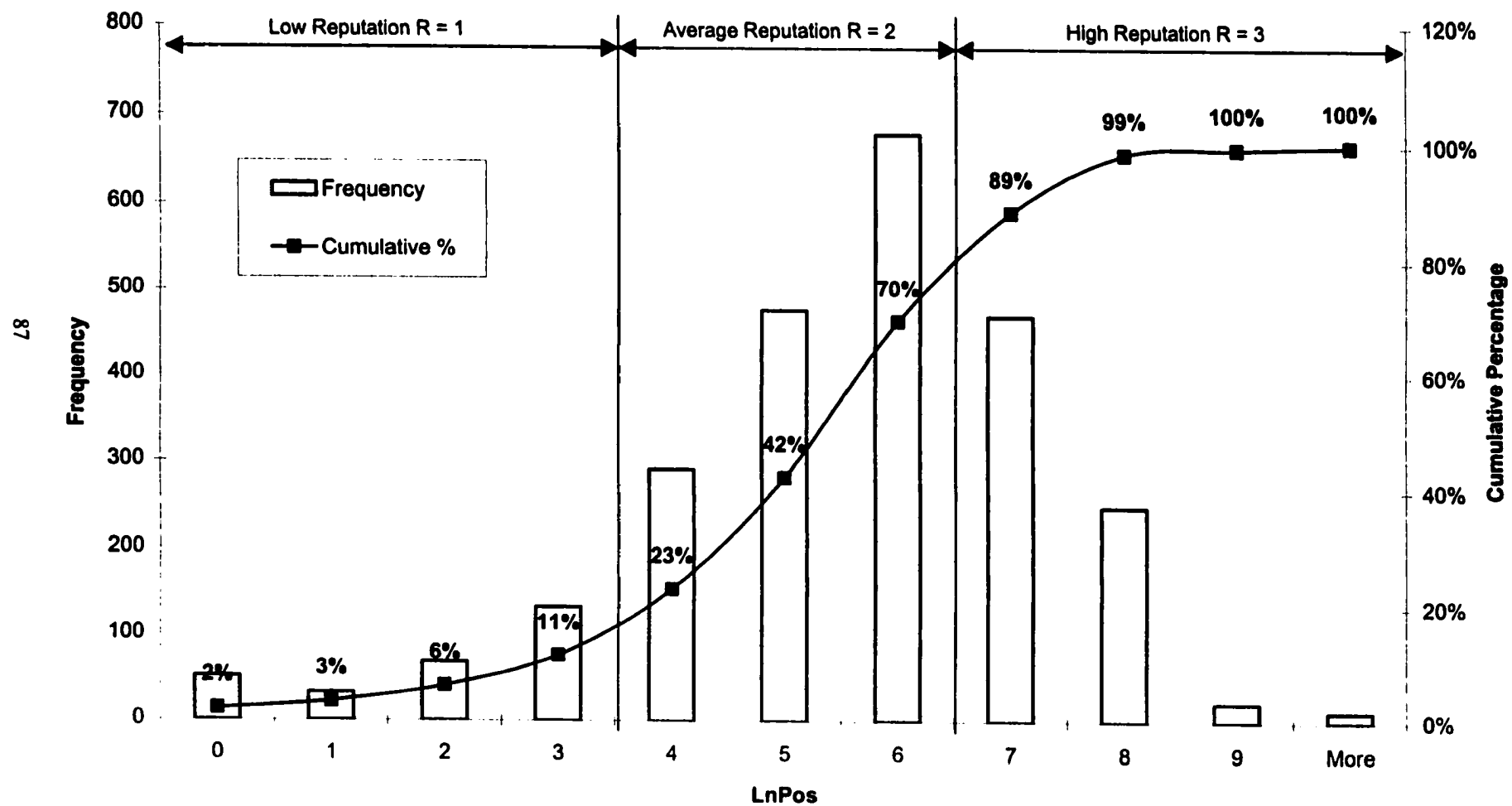


TABLE 2.1 - Industry and Exchange Repartition of the Final Sample

This table contains the repartition across industry based on the 1-digit level SIC code of all the companies included in the final uncontaminated sample.

UP MARKET							
1-digit SIC Code	General Description	All		NYSE	ASE / Nasdaq	OTC BB	Canadian
0000	Forestry, Fishing	1	0.2%	0	0	1	0
1000	Mining	23	3.7%	0	2	6	15
2000	Construction	61	9.8%	10	23	24	4
3000	Manufacturing	135	21.6%	22	60	48	5
4000	Transportation	51	8.2%	8	23	19	1
5000	Retail Trade	70	11.2%	14	27	25	4
6000	Finance, Insurance	47	7.5%	13	19	14	1
7000	Services	213	34.1%	10	115	76	12
8000	Services	14	2.2%	3	6	5	0
9000	Public Administration	0	0.0%	0	0	0	0
None*		9	1.4%	0	2	7	0
Total		624	100%	80	277	225	42
# of Companies		624		80	277	225	42

DOWN MARKET							
1-digit SIC Code	General Description	All		NYSE	ASE / Nasdaq	OTC BB	Canadian
0000	Forestry, Fishing	1	0.4%	0	0	1	0
1000	Mining	17	6.7%	12	3	2	7
2000	Construction	13	5.2%	6	5	2	0
3000	Manufacturing	57	22.6%	16	29	12	3
4000	Transportation	14	5.6%	4	6	4	0
5000	Retail Trade	29	11.5%	9	15	5	1
6000	Finance, Insurance	27	10.7%	18	5	4	2
7000	Services	76	30.2%	4	35	37	1
8000	Services	13	5.2%	3	3	7	0
9000	Public Administration	3	1.2%	0	1	2	0
None*		2	0.8%	0	0	2	0
Total		252	100%	72	102	78	14
# of Companies		252		72	102	78	14

*: For eleven of the companies included in the sample, I was unable to identify a SIC classification. This is due either to scant information about the activities of the firm or to the company having switched business orientation recently.

TABLE 2.2 - Descriptive Statistics of the Firms in the Final Sample

This table contains characteristics for all companies included in the final uncontaminated sample. In the first row of each cell, I report the mean and median statistics for each of the characteristics. The second row lists the number of firms for which I could gather the corresponding data and in parentheses I compute the percentage of firms for which data is available.

Characteristic Description	UP MARKET		DOWN MARKET	
	624 firms		252 firms	
	Mean	Median	Mean	Median
Total Assets	\$ 3,889 425	\$ 95 (68%)	\$ 3,480 203	\$ 288 (76%)
Current Market Cap.	\$ 6,057 501	\$ 136 (80%)	\$ 7,374 258	\$ 319 (97%)
Book Value Per Share	4.28 419	2.58 (67%)	197.12 202	5.50 (76%)
Price to Book Ratio	9.21 379	3.63 (61%)	3.64 202	1.91 (76%)
Shares Outstanding	141.69 425	24.36 (68%)	247.96 258	51.96 (97%)
Financial Leverage	2.87 418	1.86 (67%)	1.60 181	1.64 (68%)

Total Assets is the value reported by each company in their latest quarterly.

Current Market Capitalization is computed as the Number of Shares Outstanding times Price.

Book Value Per Share is computed as (Share Capital + Additional Paid In Capital + Retained Earnings) divided by the Number of Shares Outstanding.

Financial Leverage is defined as Average Total Assets / Average Total Common Equity, where Common Equity is computed as in Book Value per Share.

TABLE 2.3 - Reasons Leading to the Recommendation of Stocks

This table reports reasons prompting the posting recommendations for the final uncontaminated sample. The postings are classified in 5 main categories: Changes in Corporate Structure, Operations, Financials, Market and Other. Each category is itself partitioned in various sub-categories to reflect the main arguments given in the posting for the recommendations.

Reason for posting	UP MARKET		DOWN MARKET	
	#	%	#	%
	Changes in Corporate Structure			
	53	6.6%	3	1.0%
Takeover	16	2.0%	1	0.3%
Divestiture and IPO	15	1.9%	0	0.0%
Merger and Acquisition	11	1.4%	2	0.6%
Turnaround	8	1.0%	0	0.0%
Capital Raising	3	0.4%	0	0.0%
	Operations			
	190	23.8%	51	16.6%
Product Introduction and Development	58	7.3%	9	2.9%
Industry Prospects	43	5.4%	34	11.0%
Website Introduction and Improvement	42	5.3%	0	0.0%
New Contracts and Alliances	39	4.9%	8	2.6%
FDA Approval	6	0.8%	0	0.0%
Labor Dispute	2	0.3%	0	0.0%
	Financials			
	126	15.8%	23	7.5%
Soundness of Fundamentals	71	8.9%	7	2.3%
Expectations of Earnings	24	3.0%	1	0.3%
Reported Earnings	15	1.9%	3	1.0%
Undervalued	8	1.0%	10	3.2%
Upcoming or Past Split	6	0.8%	2	0.6%
Reported Increases in Sales	2	0.3%	0	0.0%
	Market			
	205	25.7%	82	26.6%
Price Upswing	107	13.4%	39	12.7%
Price Downswing	28	3.5%	20	6.5%
High and Unusual Volume	23	2.9%	6	1.9%
Price Technicals	17	2.1%	13	4.2%
Anticipation of News Release	14	1.8%	3	1.0%
Analyst Recommendation	12	1.5%	1	0.3%
Change of Exchange Listing	4	0.5%	0	0.0%
	Others			
	224	28.1%	149	48.4%
Information Request	110	13.8%	30	9.7%
None	74	9.3%	40	13.0%
Other	35	4.4%	79	25.6%
Featured in the Media	5	0.6%	0	0.0%
Total	798	100.0%	308	100.0%

TABLE 2.4 - Performance of Stocks pre- and post- Recommendation.

This table reports the market-adjusted returns (AR) and cumulative market-adjusted returns (CAR) for all recommendations. The ARs and CARs are computed as the difference in log-returns of the equity and the S&P500 Index for U.S. stocks and the difference in log-returns of the equity and the TSE 300 for Canadian stocks: $AR = R_{stock} - R_{Index}$.

UP MARKET																
# of obs.	All				Positive				Neutral				Negative			
	798				506 (63.4%)				275 (34.5%)				17 (2.1%)			
ABNORMAL RETURNS																
ARs	Value	T-stat	% Pos.		Value	T-stat	% Pos.		Value	T-stat	% Pos.		Value	T-stat	% Pos.	
-3	3.08%	4.58	**	53%	3.54%	3.97	**	54%	2.44%	2.30	*	52%	-0.02%	0.02		35%
-2	2.72%	4.96	**	53%	3.93%	5.89	**	57%	0.67%	0.68		46%	-0.17%	0.13		53%
-1	5.55%	7.26	**	58%	6.73%	6.68	**	62%	4.04%	3.48	**	52%	-4.97%	0.90		47%
0	6.34%	6.71	**	58%	6.24%	5.62	**	59%	6.98%	3.82	**	56%	-1.00%	0.53		47%
1	0.53%	0.57		49%	-0.07%	-0.05		49%	1.70%	1.28		50%	-0.64%	0.32		41%
2	0.84%	1.00		46%	1.67%	1.36		45%	-0.62%	-0.72		47%	-0.55%	0.27		35%
3	-0.51%	-0.83		45%	-0.44%	-0.53		48%	-1.10%	-1.27		40%	6.94%	-1.70		65%
CUMULATIVE ABNORMAL RETURNS																
CARs	Value	T-stat	% Pos.		Value	T-stat	% Pos.		Value	T-stat	% Pos.		Value	T-stat	% Pos.	
-20 to -1	23.46%	10.90	**	63%	27.62%	10.11	**	67%	17.89%	5.28	**	56%	-10.22%	-0.46		47%
-5 to -1	13.62%	9.26	**	61%	16.11%	8.36	**	65%	10.24%	4.41	**	55%	-5.75%	-1.01		29%
1 to 2	1.37%	1.70		47%	1.61%	1.65		46%	1.08%	0.73		49%	-1.19%	-0.51		41%
1 to 5	1.46%	1.31		48%	1.20%	0.84		48%	1.51%	0.84		47%	8.20%	1.31		59%
1 to 10	1.60%	1.31		45%	1.39%	0.93		44%	2.18%	1.00		49%	-1.68%	-0.39		35%
1 to 20	1.13%	0.67		49%	2.50%	1.09		50%	-1.01%	-0.40		48%	-4.95%	-0.76		24%

DOWN MARKET																				
All					Positive					Neutral					Negative					
# of obs.	308					229 (74.4%)					45 (14.6%)					34 (11.0%)				
ABNORMAL RETURNS																				
ARs	Value	T-stat	% Pos.			Value	T-stat	% Pos.			Value	T-stat	% Pos.			Value	T-stat	% Pos.		
-3	0.34%	1.55	58% **			0.56%	2.04 *	63% **			0.00%	-0.01	44%			-0.69%	-1.61	41%		
-2	0.40%	1.63	59% **			0.55%	1.77	61% **			0.29%	0.61	56%			-0.46%	-1.09	47%		
-1	0.24%	0.90	53%			0.49%	1.50	55%			-0.61%	-1.33	42%			-0.33%	-0.41	53%		
0	0.93%	3.56 **	67% **			1.30%	4.19 **	68% **			-0.67%	-0.85	60%			0.61%	1.61	68%		
1	-0.03%	-0.11	45%			-0.44%	-1.53	43% *			0.84%	0.97	42%			1.58%	1.90	65%		
2	-0.46%	-2.11 *	53%			-0.59%	-2.32 *	54%			0.99%	1.67	67% *			-1.47%	-3.17 **	24% **		
3	0.13%	0.64	63% **			0.10%	0.41	62% **			0.35%	0.73	71% **			0.05%	0.09	65%		
CUMULATIVE ABNORMAL RETURNS																				
CARs	Value	T-stat	% Pos.			Value	T-stat	% Pos.			Value	T-stat	% Pos.			Value	T-stat	% Pos.		
-20 to -1	3.80%	4.68 **	63% **			6.20%	6.65 **	70% **			-1.56%	-1.07	47%			-5.21%	-2.02	35%		
-5 to -1	1.71%	3.72 **	65% **			2.31%	4.46 **	71% **			1.61%	1.18	56%			-2.21%	-1.82	35%		
1 to 2	-0.49%	-1.54	49%			-1.03%	-2.92 **	48%			1.83%	1.76	60%			0.11%	0.16	38%		
1 to 5	-0.62%	-1.57	57% *			-0.86%	-1.90	59% **			0.93%	0.81	58%			-1.04%	-0.97	41%		
1 to 10	-0.35%	-0.68	58% **			-0.53%	-0.89	60% **			1.59%	1.21	60%			-1.67%	-1.19	38%		
1 to 20	-0.23%	-0.28	56% *			0.44%	0.46	60% **			0.40%	0.20	51%			-5.56%	-2.45 *	38%		

* and ** indicate significance at the 5% and 1% level respectively.

TABLE 2.5 - Performance of Positive Recommendations per Activity of Poster

This table contains the market-adjusted returns (AR) and cumulative market-adjusted returns (CAR) separated by the activity frequency of their respective posters. The first set of columns reports the performance of the stocks recommended by posters whose recommendations appear four or more times in the positive sample. The second and third sets of columns report the performance for stocks recommended by posters whose recommendations appear, respectively, two or three times and only once in the positive sample. The # of obs. row reports the number of postings included in each column and in parentheses the number of posters generating these recommendations. The ARs and CARs are computed as the difference in log-returns of the equity and the S&P500 Index for U.S. stocks and the difference in log-returns of the equity and the TSE 300 for Canadian stocks: $AR = R_{i,t+1} - R_{L,t+1}$.

UP MARKET														
4+ Postings				2 to 3 Postings				Only 1 Posting				Test of difference		
# of obs	116 (23)				149 (65)				241 (241)					
ABNORMAL RETURNS														
ARs	Value	T-stat	% Pos	Value	T-stat	% Pos	Value	T-stat	% Pos	F-Test	p-value			
-3	8.03%	2.92 *	62% *	1.85%	1.87	54%	2.42%	2.10 *	51%	3.86	0.0216 *			
-2	4.46%	3.21 *	64% **	2.91%	2.80 **	54%	4.30%	4.09 **	56%	0.49	0.6145			
-1	6.84%	3.65 *	59%	5.23%	3.37 **	64% **	7.59%	4.59 **	62% **	0.50	0.6067			
0	2.20%	1.36	61% *	7.27%	3.92 **	56%	7.54%	4.04 **	59% **	1.98	0.1390			
1	0.39%	0.33	52%	2.30%	1.18	49%	-1.75%	-0.76	48%	0.94	0.3908			
2	1.87%	1.78	45%	0.98%	0.82	50%	2.01%	0.83	43% *	0.07	0.9350			
3	0.12%	0.11	43%	-0.06%	-0.06	48%	-0.96%	-0.60	50%	0.17	0.8431			
CUMULATIVE ABNORMAL RETURNS														
CARs	Value	T-stat	% Pos	Value	T-stat	% Pos	Value	T-stat	% Pos	F-Test	p-value			
-20 to -1	28.91%	4.32 *	67% **	18.70%	5.00 **	67% **	32.51%	7.88 **	67% **	2.37	0.0944			
-5 to -1	20.55%	4.17 *	71% **	8.23%	3.36 **	60% *	18.84%	6.56 **	66% **	3.59	0.0283 *			
1 to 2	2.26%	1.36	53%	3.28%	1.36	46%	0.26%	0.23	44% *	0.94	0.3921			
1 to 5	2.89%	1.36	47%	5.02%	1.75	48%	-1.97%	-0.89	48%	2.37	0.0946			
1 to 10	4.44%	1.37	47%	3.64%	1.16	47%	-1.47%	-0.77	40% **	1.68	0.1872			
1 to 20	5.09%	1.31	54%	7.92%	1.70	51%	-2.10%	-0.62	46%	1.93	0.1468			

DOWN MARKET														
4+ Postings				2 to 3 Postings				Only 1 Posting				Test of difference		
# of obs	100 (12)				57 (25)				72 (72)					
ABNORMAL RETURNS														
ARs	Value	T-stat	% Pos	Value	T-stat	% Pos	Value	T-stat	% Pos	F-Test	p-value			
-3	0.38%	0.92	68% **	1.00%	2.08 *	61%	0.46%	0.86	58%	0.36	0.69527			
-2	0.75%	1.65	69% **	0.14%	0.26	56%	0.59%	0.93	54%	0.17	0.8422			
-1	-0.05%	-0.15	51%	-0.46%	-0.81	54%	2.00%	2.50 *	61%	5.92	0.0031 *			
0	1.42%	4.27 *	77% **	0.73%	1.55	60%	1.57%	2.00 *	63% *	0.58	0.5624			
1	-0.09%	-0.30	34% **	-0.19%	-0.38	49%	-1.12%	-1.57	50%	1.34	0.2637			
2	-0.83%	-1.99 *	58%	0.00%	0.00	53%	-0.73%	-1.77	50%	0.79	0.4571			
3	0.81%	2.64 *	75% **	-0.28%	-0.50	56%	-0.58%	-1.24	47%	2.76	0.0651			
CUMULATIVE ABNORMAL RETURNS														
CARs	Value	T-stat	% Pos	Value	T-stat	% Pos	Value	T-stat	% Pos	F-Test	p-value			
-20 to -1	8.82%	10.11 *	82% **	4.33%	1.88	60%	4.04%	2.06 *	63% *	1.41	0.2452			
-5 to -1	2.85%	4.85 *	78% **	0.31%	0.25	63%	3.14%	3.01 **	67% **	2.03	0.1341			
1 to 2	-0.92%	-2.37 *	49%	-0.19%	-0.28	47%	-1.85%	-2.25 *	47%	1.68	0.1884			
1 to 5	0.34%	0.67	70% **	-0.69%	-0.74	49%	-2.65%	-2.69 **	53%	4.00	0.0195 *			
1 to 10	0.61%	0.97	72% **	-0.04%	-0.03	54%	-2.52%	-2.06 *	49%	2.77	0.0647			
1 to 20	3.26%	2.77 *	71% **	-0.70%	-0.35	60%	-2.58%	-1.31	46%	3.77	0.0244			

* and ** indicate significance at the 5% and 1% level respectively

**TABLE 2.6 - Regression of Performance on Characteristics
of Positive Recommendation**

This table presents the results from two ordinary least-square regressions of CAR (1,20) expressed in percent for each market situation: up and down. The regressors include an intercept and dummy variables to distinguish the trading locations, the newsgroups on which the recommendation was posting, the release of news subsequent the posting or to indicate it was posted on both groups, the frequency of activity of the poster, Index D, the number of messages in the thread originated by the recommendation message, and the value of the cumulative market-adjusted return over event days -20 to -1. The regression equation is:

$$CAR = \alpha_0 + \alpha_1 \cdot D_{NYSE} + \alpha_2 \cdot D_{Nasdaq} + \alpha_3 \cdot D_{OTC\ BB} + \alpha_4 \cdot D_{Pennies} + \alpha_5 \cdot D_{Both} + \alpha_6 \cdot D_{News} + \alpha_7 \cdot D_{2-3} \\ + \alpha_8 \cdot D_4 + \alpha_9 \cdot IndexD + \alpha_{10} \cdot Thread + \alpha_{11} \cdot CAR(-20,-1) + \varepsilon_t$$

The numbers shown in parentheses are p-values.

	UP MARKET		DOWN MARKET	
	CAR 1-20		CAR 1-20	
Intercept	22.118	*	-1.906	
	(0.013)		(0.642)	
NYSE	-23.430	*	10.145	*
	(0.028)		(0.011)	
Nasdaq	-27.719	* *	0.147	
	(0.002)		(0.969)	
OTC BB	-19.557	*	-8.511	*
	(0.027)		(0.024)	
"Pennies"	8.163		4.936	
	(0.157)		(0.102)	
"Both"	26.313	*	9.162	*
	(0.015)		(0.043)	
News	4.320		-3.445	
	(0.500)		(0.076)	
2-3 postings	7.387		-0.892	
	(0.153)		(0.719)	
4+ postings	5.975		1.965	
	(0.300)		(0.422)	
Index D	1.033		3.990	
	(0.875)		(0.330)	
Thread	0.698		0.178	
	(0.127)		(0.440)	
CAR (-20,-1)	-0.269	* *	-0.038	
	(0.000)		(0.558)	
F-Statistic	6.310	* *	4.870	* *
	(0.001)		(0.000)	

* and ** indicate significance at the 5% and 1% level respectively.

TABLE 3.1 - Industry and Frequency Partition of the Final Sample

This table partitions the sample based on 1-digit level SIC codes and on the frequency of whispers for each firm.

1-digit SIC Code	General Description	All		Frequency of whispers		
				1	2 - 4	> 4
0000	Forestry, Fishing	0	0%	0	0	0
1000	Mining	25	4%	25	0	0
2000	Construction	67	9%	67	0	0
3000	Manufacturing	229	32%	228	1	0
4000	Transportation	60	8%	60	0	0
5000	Retail Trade	69	10%	1	68	0
6000	Finance, Insurance	50	7%	0	50	0
7000	Services	187	26%	0	117	70
8000	Services	21	3%	15	5	1
9000	Public Administration	0	0%	0	0	0
Total		708	100.0%			
# of Companies		708		396	241	71

TABLE 3.2 - Descriptive Statistics for Whispered Firms

This table contains characteristics for all the companies included in the sample as of May 25, 2000 as collected from the Bloomberg system. In the first row of each cell, I report the mean and median statistics for each of the characteristics. The second row lists the number of firms for which I could gather the corresponding data and in parentheses I compute the percentage of firms for which data was available. The first set of Mean-Median columns aggregates all firms in the sample. The subsequent sets of columns focus respectively on firms whispered about in only one quarter, in 2 to 4 quarters and in over 4 quarters in the sample.

Characteristic Description	All (709)		Number of Whispered Quarters							
	Mean	Median	1 (397)		2 - 4 (241)		> 4 (71)			
Total Assets	\$ 12,659	\$ 685	\$ 6,868	\$ 455	\$ 15,290	\$ 934	\$ 36,067	\$ 2,788		
	707	(100%)	396	(100%)	240	(100%)	71	(100%)		
Total Sales	\$ 5,576	\$ 504	\$ 3,559	\$ 348	\$ 6,282	\$ 560	\$ 14,466	\$ 2,089		
	708	(100%)	397	(100%)	240	(100%)	71	(100%)		
Market Value of Equity	\$ 13,552	\$ 1,628	\$ 5,291	\$ 926	\$ 14,760	\$ 2,642	\$ 54,865	\$ 14,229		
	700	(99%)	390	(98%)	239	(97%)	71	(100%)		
Financial Leverage	3.6	2.0	3.8	2.0	2.9	1.9	4.8	1.9		
	703	(99%)	392	(99%)	240	(100%)	71	(100%)		
Debt to Equity	0.5	0.1	0.6	0.1	0.4	0.0	0.2	0.0		
	475	(67%)	383	(96%)	238	(99%)	71	(100%)		
Market to Book Ratio	7.9	3.6	6.1	3.0	7.8	4.5	18.4	6.0		
	675	(95%)	376	(95%)	230	(95%)	70	(99%)		
Current Ratio	3.2	2.2	3.1	2.1	3.1	2.3	3.7	2.1		
	660	(93%)	368	(93%)	226	(94%)	66	(93%)		
ROA	-3.0%	3.0%	-4.1%	2.8%	-1.8%	3.8%	-0.3%	3.1%		
	476	(67%)	393	(99%)	240	(100%)	71	(100%)		
ROE	-5.5%	11.6%	-8.0%	11.2%	3.8%	12.2%	-20.9%	9.7%		
	457	(64%)	356	(90%)	211	(88%)	70	(99%)		
Total Return 1-Year	52.7%	3.6%	41.3%	-1.2%	72.0%	8.1%	47.8%	11.2%		
	346	(49%)	369	(93%)	231	(96%)	71	(100%)		
Sales Growth	110%	20%	125%	19%	94%	24%	82%	20%		
	591	(83%)	389	(98%)	240	(100%)	71	(100%)		
5-Year Growth	22%	15%	19%	14%	28%	16%	27%	17%		
	384	(54%)	282	(71%)	173	(72%)	57	(80%)		
Long Term Growth	28%	23%	26%	22%	32%	27%	29%	24%		
	680	(96%)	377	(95%)	234	(97%)	71	(100%)		
Price Earning Ratio	65.9	25.6	54.0	22.6	74.4	29.4	99.5	42.9		
	517	(73%)	286	(72%)	173	(72%)	58	(82%)		
Dividend Payout	26%	0%	34%	0%	15%	0%	20%	0%		
	189	(27%)	270	(68%)	156	(65%)	51	(72%)		
# of Analysts	11.1	9.0	8.8	7.0	11.8	11.0	20.8	21.0		
	692	(98%)	397	(100%)	240	(100%)	71	(100%)		
% held by institutions	50%	51%	49%	51%	49%	52%	50%	54%		
	696	(98%)	392	(99%)	235	(98%)	69	(97%)		
Short Interest Ratio	2.8	1.6	3.0	1.7	2.4	1.5	2.5	1.5		
	696	(98%)	387	(97%)	239	(99%)	71	(100%)		
Age	5.5	4.0	5.1	4.0	5.5	4.0	7.3	4.0		
	400	(56%)	232	(58%)	128	(53%)	40	(56%)		
Beta	1.09	1.03	0.97	0.92	1.18	1.14	1.37	1.30		
	622	(88%)	340	(86%)	212	(88%)	69	(97%)		

Financial Leverage is defined as Average Total Assets / Average Total Common Equity

Table 3.3 - Comparison of Analysts' and Whisper's Bias and Accuracy

The I/B/E/S quarterly consensus is the average of all analysts' individual forecasts for the company's quarterly earnings. The Most Recent I/B/E/S forecast is equal to the forecast made the closest to the actual announcement by any individual analyst, or the average of the latest forecasts made on the same day by several analysts.

The bias is computed as the scaled forecast error defined as the ratio of (Actual Earnings - Forecast) to the absolute value of the Actual Earnings.

The accuracy is computed as the absolute scaled forecast error defined as the ratio of the absolute value of (Actual Earnings - Forecast) to the absolute value of the Actual Earnings.

The rightmost part of the table reports several tests. In a first set of columns, I report the t-statistic and p-value of the test of the difference from zero of the mean of the forecast error and the p-value of the test of the difference from zero of the median of the forecast error. In the second set of columns, I present the results of two tests of the difference in median between the analysts' consensus forecast error (either quarterly forecast consensus or most recent forecast) and the whisper consensus forecast.

Panel A: BIAS											
					Test of difference from zero ^a			Test of difference in the median ^b			
					Mean	Median		Two-sample Test	One-Way Analysis		
Forecast Errors Based on:	Mean	Median	Std. Dev.	N	t-stat	p-value	p-value	Median Z	Pr.	χ^2	Pr.
I/B/E/S quarterly consensus	0.1511	0.0817	1.0709	920	4.28	0.000	0.000	13.16	0.000	173.07	0.000
Most recent I/B/E/S forecast	0.1401	0.0711	1.1392	920	3.73	0.000	0.000	11.65	0.000	135.80	0.000
Whisper consensus matching	-0.1278	-0.0200	1.0530	920	-3.68	0.000	0.000				

Panel B: ACCURACY											
					Test of difference from zero ^a			Test of difference in the median ^b			
					Mean	Median		Two-sample Test	One-Way Analysis		
Forecast Errors Based on:	Mean	Median	Std. Dev.	N	t-stat	p-value	p-value	Median Z	Pr.	χ^2	Pr.
I/B/E/S quarterly consensus	0.3334	0.1174	1.0288	920	9.83	0.000	0.000	-0.37	0.709	0.14	0.709
Most recent I/B/E/S forecast	0.3318	0.1111	1.0987	920	9.16	0.000	0.000	-1.44	0.151	2.06	0.151
Whisper consensus matching	0.4000	0.1300	0.9823	920	12.35	0.000	0.000				

^a: The first median test is the test for the difference from zero of the median scaled forecast error

^b: The second series of results tests if the median difference of the I/B/E/S consensus (Quarterly or Most Recent) forecast error and the whisper forecast error is zero.

**Table 3.4 - Accuracy Frequency and Weighted Accuracy
of the Scaled Forecast Errors for I/B/E/S versus Whisper.**

Accuracy is computed as the percentage of I/B/E/S forecasts that are closer to the actual earnings than the matching whispers are. The weighted accuracy expressed as a percentage is defined as the relative advantage of I/B/E/S forecast error over the matching whisper error. For each smaller error, I record the "advantage" over the other as their difference. For example, if I/B/E/S, whisper and actual earnings are 48, 55 and 50 cents respectively, the absolute value of difference of forecast errors is 6% in favor of the I/B/E/S consensus. It equal $\text{abs}(55-50)/50 - \text{abs}(48-50)/50 = 10\% - 4\% = 6\%$. The weighted accuracy is then computed as the ratio of Total advantage in favor of I/B/E/S over Total advantage for either of the two forecasts. There are five columns. The first column indicates the percentage of observations for which the I/B/E/S consensus is closer to the actual earnings than the whisper number. The second column indicates the percentage of times the whisper number is closer, while the tie column indicates the instance where the I/B/E/S consensus and the whisper coincide. The Weighted Accuracy reports the statistic described above, and the final column reports the number of observations used for the analysis.

Forecast Errors Based on:	I/B/E/S is closer	Whisper is closer	Tie	Weighted Accuracy	N
I/B/E/S quarterly consensus	52.3%	45.4%	2.3%	60.9%	920
Most recent I/B/E/S forecast	50.3%	39.7%	10.0%	60.5%	920

**Table 3.5 - Accuracy Frequency and Weighted Accuracy of the Scaled Forecast Errors
for I/B/E/S versus Whisper per Industry Sector and Industry Group.**

Accuracy is computed as the percentage of I/B/E/S forecasts that are closer to the actual earnings than the matching whispers are. The weighted accuracy expressed as a percentage is defined as the relative advantage of I/B/E/S forecast error over the matching whisper error. For each smaller error, I record the "advantage" over the other as their difference. For example, if I/B/E/S, whisper and actual earnings are 48, 55 and 50 cents respectively, the absolute value of difference of forecast error is 6% in favor of the I/B/E/S consensus. It equals $\text{abs}(55-50)/50 - \text{abs}(48-50)/50 = 10\% - 4\% = 6\%$. The weighted accuracy is then computed as the ratio of Total advantage in favor of I/B/E/S over Total advantage for either of the two forecasts. There are five columns. The first column indicates the percentage of observations for which the I/B/E/S consensus is closer to the actual earnings than the whisper number. The second column indicates the percentage of times the whisper number is closer, while the tie column indicates the instance where the I/B/E/S consensus and the whisper coincide. The Weighted Accuracy reports the statistic described above, and the final column reports the number of observations used for the analysis. I define the respective industry sector and industry group as the one assigned in the Bloomberg system. Panel A analyzes the data at the industry sector level while Panel B concentrates on the industry groups that have at least 10 firms in the sample.

Panel A: Industry Sector					
Forecast Errors for:	IBES is closer	Whisper is closer	Tie	Weighted Accuracy	N
Basic Materials	40.0%	53.3%	6.7%	34.4%	15
Consumer, Cyclical	54.2%	44.1%	1.7%	49.6%	118
Consumer, Non-cyclical	67.7%	30.2%	2.1%	81.9%	96
Energy	28.6%	71.4%	0.0%	65.0%	14
Financial	54.8%	45.2%	0.0%	52.7%	62
Industrial	59.0%	38.5%	2.6%	89.0%	39
Technology	51.1%	46.1%	2.9%	59.3%	560
Utilities	61.1%	33.3%	5.6%	43.1%	18

Panel B: Industry Group						
Forecast Errors for	IBES is closer	Whisper is closer	Tie	Weighted Accuracy	N	
Retail	52.2%	46.3%	1.5%	45.2%	67	Consumer, Cyclical
Pharmaceuticals	65.7%	31.4%	2.9%	87.7%	35	Consumer, Non-cyclical
Commercial Services	76.0%	20.0%	4.0%	93.4%	25	Consumer, Non-cyclical
Health Care	45.0%	55.0%	0.0%	38.9%	20	Consumer, Non-cyclical
Oil and Gas Producers	28.6%	71.4%	0.0%	65.0%	14	Energy
Diversified Financial Services	50.0%	50.0%	0.0%	50.9%	40	Financial
Banks	62.5%	37.5%	0.0%	72.7%	16	Financial
Electronics	31.3%	62.5%	6.3%	45.6%	16	Industrial
Software	51.9%	44.3%	3.8%	55.5%	210	Technology
Computers	54.3%	44.0%	1.7%	54.6%	116	Technology
Semiconductors	41.7%	57.3%	1.0%	65.9%	96	Technology
Telecommunication Equipment	50.0%	45.0%	5.0%	68.9%	80	Technology
Telecommunications	47.8%	47.8%	4.3%	63.2%	23	Technology
Aerospace/Defense	53.3%	46.7%	0.0%	58.9%	15	Technology
Biotechnology	73.3%	26.7%	0.0%	89.4%	15	Technology
Telephone	68.8%	25.0%	6.3%	92.5%	16	Utilities

*, **, and *** indicate significant difference from 50% at the 10%, 5%, and 1% level respectively.

**Table 3.6 - Regression Test of whether the Analysts' Consensus or Whisper
Contains Valuable Information.**

This table reports the result of a regression of the difference between the current and the previous quarter's actual earnings, in essence, the change in earnings on the estimated change in earnings according to the analysts and the whisperers. The estimated equation is specified as follows:

$$(AE_t - AE_{t-1}) = \alpha + \beta (I/B/E/S_t - AE_{t-1}) + \gamma (W_t - AE_{t-1}) + \varepsilon_t$$

The figures in parentheses are the p-value corresponding to the regression coefficient presented above.

Parameter	Estimate	t-stat	p-value
Intercept	0.021	5.71	0.000
I/B/E/S _t - AE _{t-1}	0.952	38.49	0.000
W _t - AE _{t-1}	0.003	0.14	0.885
Statistics			
R ²	0.827		
Adj R ²	0.827		
F-stat	1855.59		
Significance	0.000		
N	789		

Table 3.7 - Dependability of Whispers as Indicator of the Market's True Expectations.

This table reports the percentage of occurrence for which the whisper number is an accurate predictor of stock price movement. That is, if it is an accurate predictor, the market-adjusted return should be positive when the actual earnings are higher than the whisper and negative when the actual earnings are lower than the whisper number. The t-statistics and the p-value denote the difference from 50% of the analyzed statistic.

Panel A: Overall					
Based on 24-hour price movement					
	Mean	N	t-stat	p-value	
Overall	54.6%	1453	3.56	0.001	
	AR > 0	AR < 0			
If Whisper < Actual	49.1%	50.9%	561	-0.38	0.704
If Whisper $\geq$ Actual	42.0%	58.0%	892	4.81	0.000
Based on 5-day price movement					
	Mean	N	t-stat	p-value	
Overall	55.0%	1453	3.82	0.000	
	CAR > 0	CAR < 0			
If Whisper < Actual	49.9%	50.1%	561	-0.04	0.966
If Whisper $\geq$ Actual	41.8%	58.2%	892	4.95	0.000
Panel B: Specific Scenarios					
The first section investigates the behavior of market-adjusted returns under the scenario that the actual earnings fall short of the whisper, but yet are higher than the I/B/E/S consensus forecast. Under the assumption that the whisper number is the true market's expectations, the market-adjusted return should be negative. I report the percentage occurrence of such behavior.					
I/B/E/S Consensus < Actual Earnings < Whisper Number					
Based on 24-hour price movement					
	AR > 0	AR < 0	N	t-stat	p-value
Overall	41.8%	58.2%	306	2.89	0.004
Based on 5-day price movement					
	CAR > 0	CAR < 0	N	t-stat	p-value
Overall	44.1%	55.9%	306	2.07	0.039
This second section investigates the behavior of market-adjusted returns under the scenario that the actual earning beat the whisper, but yet are lower than the I/B/E/S consensus forecast. Under the assumption that the whisper number is the true market's expectations, the market-adjusted return should be positive. I report the percentag occurrence of such behavior.					
Whisper Number < Actual Earnings < I/B/E/S Consensus					
Based on 24-hour price movement					
	AR > 0	AR < 0	N	t-stat	p-value
Overall	58.3%	41.7%	24	0.81	0.426
Based on 5-day price movement					
	CAR > 0	CAR < 0	N	t-stat	p-value
Overall	62.5%	37.5%	24	1.24	0.228

Table 3.8 - Regression Test of whether the Analysts' Consensus or Whisper Represent the Market's Expectations.

This table reports the result of a regression of the cumulative market-adjusted returns following the actual earnings announcement on two analysts and whisper characteristics. The independent variables are defined as follows:

- I/B/E/S Forecast Error:** this is defined as the difference between actual earning and the I/B/E/S forecast scaled by the stock price 15 trading days before the earnings announcement.
- I/B/E/S Forecast - Whisper:** this is defined as the difference between the whisper forecast and the I/B/E/S consensus scaled by the stock price 15 trading days before the earnings announcement.

The cumulative market-adjusted returns are based on the difference in return from the company's stock's price and the S&P 500 return over the same period. The day of the earnings announcement is Day 0. Therefore CAR(-1,1) represents the return earned over the market's performance from opening a position in the stock at the close of the day preceding the earnings release and closing the position the day following Day 0. Similarly, I compute the values of CAR(-1,2) and CAR(-1,4).

The figures in parentheses are the p-value corresponding to the regression coefficient presented above.

Parameter	CAR(-1,1)	CAR(-1,2)	CAR(-1,4)
Intercept	-0.008 (0.060)	-0.014 (0.001)	-0.021 (0.000)
I/B/E/S Forecast Error	1.584 (0.007)	1.485 (0.024)	2.264 (0.002)
I/B/E/S Forecast - Whisp.	-0.742 (0.258)	-1.123 (0.128)	-1.196 (0.153)
Statistics			
R ²	0.008	0.007	0.011
Adj R ²	0.006	0.005	0.008
F-Stat	3.83	3.1	4.91
Significance	0.022	0.046	0.008
N	922	922	922

**Table 3.9 - Average Cumulative Market-Adjusted Returns
to Trading Strategies based on the Relative Position
of Analysts' Consensus Forecast and Whisper.**

This table reports the analysis of the informational value contained in the whispers as exposed through implementing the trading strategy described in the panel.

The cumulative market-adjusted returns are based on the difference in return from the company's stock's price and the S&P 500 return over the same period. The day of the earnings announcement is Day 0. Therefore CAR(-1,1) represents the return earned over the market's performance from opening a position in the stock at the close of the day preceding the earnings release and closing the position the day following Day 0. Similarly, I compute the values of CAR(-1,2) and CAR(-1,4).

Strategy: Buy (Short) if whisper > (<) Analysts' Consensus per share	Market-Adjusted Cumulative Returns		
	All	Longs	Shorts
CAR(-1,1)	-0.44%	-0.77%	0.78%
t-stat	-1.14	-1.78	0.96
p-value	0.253	0.076	0.337
N	919	722	197
CAR(-1,2)	-0.81%	-1.49%	1.71%
t-stat	-1.86	-3.06	1.85
p-value	0.064	0.002	0.066
N	919	722	197
CAR(-1,4)	-1.07%	-2.07%	2.59%
t-stat	-2.17	-3.66	2.65
p-value	0.030	0.000	0.009
N	919	722	197

Table 4.1 - CGC's Schedule of Services and Fees

This table provides a convenient way to determine the cost associated with the certification of comics via the CGC services. From this information, collected on the CGC website, I am able to determine upper and lower boundaries of the cost of certification of each certified comic book auctioned on eBay.

Grading Service	Estimated Turnaround	Maximum Value per Book	Minimum Quantity	Retail Price per Book	Dealer Rebate
Economy	25-30 business days	up to \$250	minimum 3	\$ 20.00	\$ 4.00
Standard	12-15 business days	up to \$1,000	no minimum	\$ 35.00	\$ 7.00
Express	3-5 business days	up to \$5,000	no minimum	\$ 55.00	\$ 11.00
WalkThru	Same business day	no limit	no minimum	\$ 95.00	\$ 20.00
Modern [*]	12-15 business days	no limit	minimum 4	\$ 14.00	\$ 3.00
Re-Holder ^{**}	5 business days	no limit	no minimum	\$ 5.00	None
Re-Certification ^{***}	Service selected	Service selected	Service selected	...	...

^{*}: Modern service is limited to books published from 1975 to present

^{**}: Re-Holder Service is for a chipped, scratched or cracked holder that has not been opened or had its seals broken. We will place your comic in a new holder.

^{***}: Comics that have been removed from the CGC holder can receive a \$5 discount (\$10 for WalkThru) if sent for Re-Certification with its original CGC holder label. Label is for discount only.

Comics resubmitted for Re-Certification with their original label are not guaranteed to receive the same grade.

Table 4.2 - Description of the Sample Characteristics of Previous eBay Auctions Research.

Title	Authors	Sample	Size	Time Period
Reputation in an Internet Auction Market	C.G. McDonald V.Carlos Slawson Jr.	MIB Harkey-Davidson Barbie Dolls	451	Jan.-July 1998
Does a Seller's eCommerce Reputation Matter?	M.I. Melnik J. Alm	Mint 1999 \$5 U.S. Gold Coin	450	May-June 2000
Pennies from eBay: the Determinants of Price in Online Auctions	D. Lucking-Reiley D. Bryan N. Prasad D. Reeves	U.S. Indian Head Pennies minted between 1859 and 1909	461	July-Aug. 1999
Public Versus Secret Reserve Prices in eBay Auctions: Results from a Pokémon Field Experiment	R. Katkar D. Lucking-Reiley	Matched Pairs of Pokémon cards	50	April 2000
Reputation in Auctions: Theory and Evidence from eBay	D. Houser J. Wooders	Pentium III 500 megahertz processors	95	Sept.-Dec. 1999
Winner's Curse, Reserve Prices and Endogenous Entry: Empirical Insights from eBay Auctions	P. Bajari A. Hortacsu	U.S. Mint/proof sets	516	Sept.-Oct. 1998

Table 4.3 - Impact on Price

	McDonald Stewson Jr.		Melnik Alm		Lucking-Reiley Bryan Prasad Reeves		Lucking-Reiley Kattar		Houser Woods		Bajari Hortaçsu	
Variables	Sign	Significance	Sign	Significance	Sign	Significance	Sign	Significance	Sign	Significance	Sign	Significance
Bid Information												
BIDS	+	Yes									+	Yes
Reputation Variables												
Rating	+	Yes	+	Yes	NA	No			+	Yes		
Positive Rating					+	Yes						
NonPositive Rating									-	Yes		
Negative Rating			-	Yes	-	Yes					-	No
Shades									-	No		
Low Rating	-	Yes										
High Rating	+	Yes										
Credit * Low Rating	-	Yes										
Credit * High Rating	+	Yes										
BuyerPos									+	No		
BuyerNonPos									-	No		
Avg. Exp.											-	No
Win. Exp.											-	No
Auction Characteristics												
Volume	-	Yes			+	No						
MinBid											+	Yes
MinBid/Bookvalue					+	Yes					+	No
Reserve							+	Yes	+	Yes		
Public												
Length			+	No	+	Yes						
DAYS5	-	No			-	No			+	No		
DAYS7	-	No			+	Yes			-	No		
DAYS10					+	Yes			+	No		
Late Hour	-	Yes										
Closing Time			+	Yes								
FSS			+	No	-	No						
Shipping Amount	-	Yes	-	Yes								
Shipping High	-	Yes										
Insurance			+	No								
Credit Card	NA	No	+	No					+	No		
Exclude									-	Yes		
Scan			+	No								
Item Characteristics												
Bookvalue					+	Yes						
MarketPrice									+	Yes		
Gold			+	Yes								
Used									-	No		
Blemish											-	Yes
Smoke free	+	Yes										
Retail									+	Yes		

Notes:

McDonald
Stewson Jr.

They use both Price and Bids in logarithmic form. They define High and Low with respect to the sample median. Late hour is a dummy indicating auctions ending between midnight and 4 a.m. PST.

Melnik
Alm

They use both Reputation and Negative feedback in logarithmic form. Gold is the New York closing price. Closing Time is a dummy variable equal to one if the auction ends between 3 p.m. and 7 p.m. PST. FSS is a dummy variable indicating auction ending on Friday, Saturday or Sunday.

Lucking-Reiley
Bryan
Prasad
Reeves

They use Price, Book Value, Minimum Bid and Negative feedback in logarithmic form. Book values are obtained from the Coin Universe website.

Lucking-Reiley
Kattar

Public is a dummy variable that equals 1 when there is no secret reserve placed on the auction. Therefore, Public = 1 - Reserve.

Houser
Woods

Shipping cost is incorporated in the selling price. Shades is a dummy variable equal to 1 when the seller either registered on eBay within the last 30 days or changed his screen-name within the same time frame. Retail is a dummy variable equal to 1 if the processor is the retail version. Market prices are taken from CPUReview.com. Exclude is another dummy variable. It indicates if the seller excludes buyers whose reputation is below a specific level.

Bajari
Hortaçsu

The dependent variable is not price but what the authors call revenue. Revenue equals the ratio of the highest bid to the item's book value, not conditional on sale. Avg. Exp. is the average experience of the bidders, as measured by the number of previous transactions conducted on eBay. Similarly, Win. Exp. is the experience of the auction winner.

Table 4.4 - Sample Statistics

This table contains summary statistics for the top 10 comic books sold the most often in the sample. Panel A records some general statistics for all auctions and auctions that resulted in actual sales for each of the 10 comic books. The last two columns in Panel A report respectively the percentage of copies sold that were certified by the CGC and the percentage of auctioneers that offer a refund policy on the item sold.

Panel B reports information on the prices realized in the auctions and the grades of the copies sold. For both measures, I report the mean, median and the standard deviation. While the Price is simply expressed in dollar terms, the grade is based on the 10-point scale rating used by the CGC.

Panel A: General Characteristics

Issue	# Sold	Price Median	Grade Median
Amazing Fantasy 15	33	\$ 1,525	VG
Amazing Spiderman 1	51	\$ 1,249	VG-
Amazing Spiderman 2	56	\$ 283	VG-
Amazing Spiderman 5	69	\$ 115	VG
Amazing Spiderman 14	90	\$ 203	VG
Amazing Spiderman 19	113	\$ 47	VG/FN
Amazing Spiderman 41	96	\$ 26	VG
Avengers 1	82	\$ 204	G/VG
Avengers 4	107	\$ 201	VG+
Avengers 11	50	\$ 34	VG/FN
Captain America 100	130	\$ 50	FN
Daredevil 1	98	\$ 246	VG+
Doctor Strange 169	72	\$ 22	FN
Fantastic Four 1	41	\$ 860	G/VG
Fantastic Four 3	32	\$ 255	VG+
Fantastic Four 48	176	\$ 122	VG/FN
Incredible Hulk 1	24	\$ 490	G+
Incredible Hulk 6	44	\$ 126	VG
Iron Man and Sub-Mariner 1	141	\$ 27	FN
Iron Man 1	164	\$ 88	FN+
Showcase 4	9	\$ 1,500	VG
Silver Surfer 1	128	\$ 75	VG/FN
Silver Surfer 2	108	\$ 31	FN
Silver Surfer 4	85	\$ 86	FN
Sub-Mariner 1	111	\$ 31	FN/VF
Tales of Suspense 39	38	\$ 418	VG
The Brave and the Bold 28	19	\$ 230	G/VG
X-Men 1	86	\$ 510	VG
X-Men 16	72	\$ 31	FN
X-Men 2	69	\$ 159	VG

Panel B: Top 10 General Characteristics

Issue	#		% Sold	Of Sold ones	
	Auctioned	Sold		% Certified	% Warranty
Fantastic Four 48	298	176	59%	32%	13%
Iron Man 1	268	164	61%	34%	12%
Iron Man and Sub-Mariner 1	171	141	82%	18%	12%
Captain America 100	201	130	65%	18%	16%
Silver Surfer 1	217	130	60%	27%	10%
Amazing Spiderman 19	153	113	74%	19%	21%
Sub-Mariner 1	161	111	69%	30%	14%
Silver Surfer 2	209	108	52%	19%	17%
Avengers 4	182	107	59%	32%	17%
Daredevil 1	149	98	66%	27%	17%

Panel C: Top 10 Pricing and Grading Characteristics

Issue	Price			Grade		
	Mean	Median	Std Dev	Mean	Median	Std. Dev.
Fantastic Four 48	\$ 280	\$ 122	\$ 465	5.33	5.00	2.47
Iron Man 1	\$ 206	\$ 88	\$ 323	6.44	6.50	2.49
Iron Man and Sub-Mariner 1	\$ 52	\$ 27	\$ 73	5.78	6.00	2.27
Captain America 100	\$ 119	\$ 50	\$ 191	5.81	6.00	2.56
Silver Surfer 1	\$ 177	\$ 75	\$ 311	5.62	5.25	2.62
Amazing Spiderman 19	\$ 94	\$ 47	\$ 156	5.09	5.00	2.15
Sub-Mariner 1	\$ 69	\$ 31	\$ 105	6.29	7.00	2.51
Silver Surfer 2	\$ 75	\$ 31	\$ 152	5.95	6.00	2.52
Avengers 4	\$ 343	\$ 201	\$ 433	4.77	4.50	2.55
Daredevil 1	\$ 424	\$ 246	\$ 547	4.55	4.50	2.56

Table 4.5 - Grading Standards and Guidelines

This table provides a synopsis of general guidelines to grading comic books. For every grade (listed in the left column), and for five major comic book structure characteristics, the table indicates the condition expected of the comic book to qualify for the grade or delineates the defaults acceptable for the grade. This table is adapted from Ernst and Mary Gerber's Photo-Journal Guide To Comic Books.

	Arm's Length Overall Appearance	Interior Page Condition	Cover Flaws	Color / Gloss	Other
Mint	Like New	Near White	None except 1/16" flaw, top and bottom spine	Bright colors, full original gloss	Flat, staples directly on spine, no "perked" up corners
Near Mint	Almost Like New	Off White	Faint Stress line on spine	Colors slightly faded, but cover gloss intact	Slight perking of cover corners, one 1/8" rip
Very Fine	Read a Few Times	Slight Yellowing	Slight off spine staples		1/8" corner creases
Fine	Read	Yellow	Minor stress line at staples	Still clean and bright, colors and gloss losing original lustre	Stress lines around staples
Very Good	Well Read	Slight Browning	Creases along spine		One or two 1/4" rips
Good		Brown	Minor creases on cover corners "Chipping" along cover edges Cover loose	Original gloss mostly gone	1/2" spine roll 1" cover rips
Fair	Worn		Well worn cover Multiple creases, folds, loose cover, pages and pieces missing	No gloss but clean	Cover rips 1-3"
Poor	Not Collectible	Brittle		Faded colors, well worn and dirty covers	1-2" pieces missing Pages missing

Table 4.6 - Hypothesis 1 - 1

In this table, I test the following:

Hypothesis 1:

- 1) Prices realized are higher for CGC-graded books than for similar non-certified graded books

In order to test the hypothesis, I match observations along several factors to isolate the influence that certification has on the price realized in the auction, expressed as the following transform:

$$\text{Premium} = \frac{\text{Certified Book Price} - \text{Non - Certified Book Price}}{\text{Certified Book Price} + \text{Non - Certified Book Price} \div 2}$$

I find pairs of comic books that have sold and are of the same issue, fall into the same categories of R-reputation and HasNeg that define 6 groups. Furthermore, I impose that they must have the same warranty specification and examine the information at the grade level. Consequently, books can be fall in one of 30 books * 25 grades * 2 warranty options * 6 groups = 9,000 categories. I find 174 pairs for which two comic books fall in the same category and one is certified while the other is not.

The table presents the overall realized premium, its significance, the number of positive premium and the sample size as well as the results per grade of the comic books.

Grade	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-
9.9	-	-	-	-
9.8	-	-	-	-
9.6	146%	0.1339	100%	2
9.4	70%	0.0065	100%	7
9.2	46%	0.0022	100%	4
9.0	56%	0.0001	82%	17
8.5	47%	0.0052	100%	7
8.0	64%	0.0001	100%	16
7.5	53%	0.0027	89%	9
7.0	36%	0.0020	85%	13
6.5	30%	0.0110	92%	12
6.0	41%	0.0001	94%	17
5.5	37%	0.0047	100%	4
5.0	33%	0.0061	83%	12
4.5	43%	0.0001	92%	13
4.0	33%	0.0002	83%	18
3.5	69%	0.1036	100%	3
3.0	8%	0.5789	50%	10
2.5	8%	0.7425	67%	3
2.0	20%	0.0364	100%	4
1.8	52%	-	100%	1
1.5	4%	-	100%	1
1.0	6%	-	100%	1
0.5	-	-	-	-
Overall	43%	0.0001	89%	174

Table 4.7 - Hypothesis 1 - 2

In this table, I test the following:

Hypothesis 1:

- 2) Prices realized are higher when the seller offers a warranty than when she does not.

In order to test the hypothesis, I match observations along several factors to isolate the influence that the explicit warranty has on the price realized in the auction, expressed as the following transform:

$$\text{Premium} = \frac{\text{Warranty Book Price} - \text{Non - Warranty Book Price}}{\frac{\text{Warranty Book Price} + \text{Non - Warranty Book Price}}{2}}$$

I find pairs of comic books that have sold and are of the same issue, fall into the same categories of R-reputation and HasNeg that define 6 groups. Furthermore, I impose that they must have the same certification specification and examine the information at the grade level. Consequently, books can be fall in one of 30 books * 25 grades * 2 certification options * 6 groups = 9,000 categories. I find 171 pairs for which two comic books fall in the same category and one is certified while the other is not.

The table presents the overall realized premium, its significance, the number of positive premium and the sample size as well as the results per grade of the comic books.

Grade	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-
9.9	-	-	-	-
9.8	-	-	-	-
9.6	17%	-	100%	1
9.4	-11%	0.1711	0%	2
9.2	5%	0.4991	80%	10
9.0	-4%	0.7215	40%	5
8.5	12%	0.5201	80%	5
8.0	-17%	0.0783	17%	6
7.5	0%	0.9898	33%	3
7.0	7%	0.5369	67%	6
6.5	-2%	0.8574	43%	7
6.0	1%	0.4281	62%	13
5.5	-1%	0.8972	50%	2
5.0	13%	0.5249	44%	9
4.5	5%	0.5112	59%	17
4.0	0%	0.9793	39%	33
3.5	13%	0.3305	57%	7
3.0	0%	0.9798	55%	11
2.5	-15%	0.3219	50%	8
2.0	-9%	0.3976	38%	16
1.8	20%	0.5457	33%	3
1.5	26%	0.4486	100%	2
1.0	-7%	0.6595	40%	5
0.5	-	-	-	-
Overall	1%	0.5909	50%	171

Table 4.8 - Hypothesis 1 - 3

In this table, I test the following:

Hypothesis 1:

- 3) Prices realized are higher when the seller has an established reputation than when she does not

In order to test the hypothesis, I match observations along several factors to isolate the influence that reputation has on the price realized in the auction, expressed as the following transform:

$$\text{Premium} = \frac{\text{High Reputation Book Price} - \text{Low Reputation Book Price}}{\frac{\text{High Reputation Book Price} + \text{Low Reputation Book Price}}{2}}$$

In Panel A, I rely on R-reputation and find two sets of pairs of comic books that have sold and are of the same issue and have the same certification, warranty and reputation quality specification. I replicate the procedure to examine the premium of high reputation copies to low reputation copies and also the premium of high reputation copies to mid reputation copies. In each case, books can be fall in one of 30 books * 25 grades * 2 certification options * 2 warranty options * 2 quality options = 6,000 categories. I find 89 High - Low pairs and 157 High - Mid pairs. In Panel B, I examine reputation "cleanliness" by relying on HasNeg to differentiate similar books in all other aspects except that the first seller has no negative feedbacks while the other seller has at least one negative feedback. I have 9,000 categories and I find 333 pairs. For each panel, the table presents the overall realized premium, its significance, the number of positive premium and the sample size as well as the results per grade of the comic books.

Panel A - Test Based on R-reputation

Grade	High - Low				High - Average			
	Premium	p-value	% Pos.	# of Pairs	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-	-	-	-	-
9.9	-	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-
9.4	-17%	0.5999	87%	3	-38%	0.9881	0%	4
9.2	21%	0.3198	100%	3	13%	0.2540	100%	3
9.0	17%	-	100%	1	-18%	0.2848	25%	4
8.8	68%	-	100%	1	9%	0.8368	50%	4
8.0	23%	0.3047	80%	5	-8%	0.5182	50%	6
7.8	24%	0.8418	100%	2	-8%	0.5784	29%	7
7.0	-5%	0.7707	87%	7	9%	0.4822	71%	7
6.8	-7%	0.8413	80%	4	8%	0.6827	56%	8
6.0	18%	0.2778	88%	8	8%	0.3828	69%	13
5.8	28%	0.2888	87%	3	26%	0.2218	80%	5
5.0	-38%	0.6181	0%	5	-9%	0.2861	29%	7
4.8	19%	0.2915	83%	6	3%	0.7435	47%	15
4.0	3%	0.7143	38%	13	10%	0.6171	71%	21
3.8	-35%	-	0%	1	0%	0.9735	87%	6
3.0	7%	0.8114	50%	4	-3%	0.8436	28%	7
2.8	-28%	-	0%	1	-10%	0.6398	40%	8
2.0	-3%	0.7711	38%	18	0%	0.9884	86%	18
1.8	-189%	-	0%	1	-33%	0.5531	50%	4
1.8	-78%	-	0%	1	-32%	0.2510	0%	3
1.0	9%	0.8950	80%	2	5%	0.7898	87%	6
0.8	-	-	-	-	18%	0.7369	33%	3
Overall	1%	0.7898	52%	89	0%	0.6395	53%	157

Panel B - Test Based on HasNeg

Grade	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-
9.9	-	-	-	-
9.8	-2%	-	0%	1
9.6	-15%	0.7131	33%	3
9.4	0%	0.9963	67%	8
9.2	-4%	0.7131	38%	8
9.0	-4%	0.8573	33%	18
8.8	7%	0.4941	57%	7
8.0	-5%	0.6275	58%	18
7.8	4%	0.6388	55%	11
7.0	8%	0.5945	44%	18
6.8	-8%	0.4737	33%	18
6.0	1%	0.8982	62%	25
5.8	-14%	0.2474	33%	8
5.0	8%	0.9117	33%	18
4.8	-10%	0.0838	36%	22
4.0	8%	0.3709	53%	38
3.8	0%	0.9836	53%	15
3.0	-2%	0.7883	50%	18
2.8	-2%	0.8989	54%	13
2.0	8%	0.1738	62%	29
1.8	4%	0.7821	80%	10
1.8	18%	0.2813	75%	8
1.0	-2%	0.8050	50%	18
0.8	-8%	0.7829	80%	5
Overall	0%	0.6137	48%	333

Table 4.8 - Hypothesis 2

In this table, I test the following:

Hypothesis 2:

- 1) The reputation differential is higher for comic books without certification
- 2) The warranty differential is higher for comic books without certification

In order to test the hypothesis, I match observations along several factors to isolate the influence that reputation or warranty has on the price realized in the auction, expressed as a premium similar to Tables VII and VIII.

In Panel A, I rely on R-reputation and find for both certified and non-certified pairs of comic books that have sold and are of the same issue and have the same warranty and reputation quality specification. I replicate the procedure from Table VIII to examine the premium of high reputation copies to low reputation copies. In each case, books can be fall in one of 30 books * 25 grades * 2 warranty options * 2 quality options = 3,000 categories. I find 82 High - Low pairs for the non-certified comics and 7 High - Low pairs for the certified comic books. In Panel B, I examine reputation "cleanliness" and find 259 pairs for the non-certified comics and 74 pairs for the certified comic books. In Panel C, I focusing on the warranty, I find 139 pairs for the non-certified and 32 pairs for the certified comic books.

For each panel, the table presents the overall realized premium, its significance, the number of positive premium and the sample size as well as the results per grade of the comic books for each of the non-certified and certified categories.

Panel A - Test Based on R-reputation								
The Grade	Non-CGC				CGC			
	Premium	p-value	% Pos.	# of Pairs	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-	-	-	-	-
9.9	-	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-
9.7	-	-	-	-	-	-	-	-
9.6	-	-	-	-	-	-	-	-
9.5	-86%	-	0%	1	8.7%	0.4325	100%	2
9.4	26%	0.4141	100%	2	7.1%	-	100%	1
9.3	17%	-	100%	1	-	-	-	-
9.2	83%	-	100%	1	-	-	-	-
9.1	-	-	-	-	-	-	-	-
9.0	-	-	-	-	61.5%	-	100%	1
8.9	11%	0.8223	50%	4	23.0%	0.8842	100%	2
8.8	0%	0.8843	87%	6	-32.8%	-	0%	1
8.7	-6%	0.8989	50%	4	-	-	-	-
8.6	13%	0.3771	75%	8	-	-	-	-
8.5	24%	0.2881	100%	3	-	-	-	-
8.4	-38%	0.8138	0%	5	-	-	-	-
8.3	13%	0.3787	83%	8	-	-	-	-
8.2	1%	0.8989	38%	13	-	-	-	-
8.1	-37%	-	0%	1	-	-	-	-
8.0	8%	0.7583	50%	4	-	-	-	-
7.9	-37%	-	0%	1	-	-	-	-
7.8	-5%	0.4888	38%	18	-	-	-	-
7.7	-152%	-	0%	1	-	-	-	-
7.6	-75%	-	0%	1	-	-	-	-
7.5	6%	0.9308	50%	2	-	-	-	-
7.4	-	-	-	-	-	-	-	-
Overall	-2%	0.7083	45%	82	12%	0.4080	86%	7

Panel B - Test Based on Reputation								
The Grade	Non-CGC				CGC			
	High - Low / Avg	p-value	% Pos.	# of Pairs	High - Low / Avg	p-value	% Pos.	# of Pairs
10	-	-	-	-	-	-	-	-
9.9	-	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-
9.7	-78%	-	0%	1	-1.8%	-	100%	1
9.6	-6%	0.8823	33%	3	2.8%	0.8248	50%	2
9.5	-48%	-	0%	1	3.8%	0.7883	83%	6
9.4	4%	0.8484	43%	7	-8.8%	0.8280	87%	7
9.3	14%	0.8483	67%	3	1.1%	0.1472	27%	11
9.2	0%	0.8890	50%	8	-8.8%	0.8231	83%	8
9.1	24%	0.1738	75%	4	-7.8%	0.4880	43%	7
9.0	2%	0.8487	43%	12	10.7%	0.8178	80%	4
8.9	-10%	0.3414	28%	14	7.8%	0.8184	80%	4
8.8	-3%	0.8443	68%	20	18.8%	0.3537	60%	6
8.7	-11%	0.3888	33%	8	-	-	-	-
8.6	3%	0.7727	33%	18	-0.8%	0.8750	33%	3
8.5	-10%	0.1221	48%	20	-4.7%	0.2837	0%	2
8.4	3%	0.5337	48%	35	10.3%	0.1242	100%	3
8.3	1%	0.8488	58%	12	-7.7%	0.3018	33%	3
8.2	-6%	0.3782	50%	18	21.8%	0.8873	50%	2
8.1	-1%	0.8888	42%	12	8.2%	-	100%	1
8.0	8%	0.8838	68%	28	-25.8%	-	0%	1
7.9	4%	0.7732	60%	10	-	-	-	-
7.8	17%	0.2705	75%	8	-	-	-	-
7.7	-2%	0.7880	50%	18	-	-	-	-
7.6	-7%	0.8088	60%	5	-	-	-	-
Overall	0%	0.8084	50%	258	0%	0.8813	50%	74

Panel C - Test Based on Warranty

Grade	Non-CGC				CGC			
	Premium	p-value	% Pos.	# of Pairs	Premium	p-value	% Pos.	# of Pairs
10	-	-	-	-	-	-	-	-
9.9	-	-	-	-	-	-	-	-
9.8	-	-	-	-	-	-	-	-
9.6	-	-	-	-	18.6%	-	100%	1
9.4	-	-	-	-	-7.2%	0.3519	0%	2
9.2	20%	-	100%	1	3.4%	0.8432	78%	9
9.0	-36%	-	0%	1	5.5%	0.4889	50%	4
8.5	21%	0.8898	100%	2	5.2%	0.8799	87%	3
8.0	-13%	0.3039	25%	4	-18.5%	0.3513	0%	2
7.5	-13%	-	0%	1	2.9%	0.8118	50%	2
7.0	11%	0.3944	80%	9	8.1%	-	100%	1
6.5	-2%	0.8439	43%	7	-	-	-	-
6.0	1%	0.8918	55%	11	63.5%	0.4807	100%	2
5.5	0%	0.8947	50%	2	-	-	-	-
5.0	7%	0.5999	59%	9	-	-	-	-
4.5	3%	0.6822	60%	15	17.8%	0.8359	50%	2
4.0	3%	0.8953	47%	32	0.8%	-	100%	1
3.5	12%	0.4400	50%	8	29.2%	-	100%	1
3.0	4%	0.7076	59%	9	-3.4%	0.8049	50%	2
2.5	-14%	0.3309	50%	8	-	-	-	-
2.0	-7%	0.4419	38%	16	-	-	-	-
1.8	19%	0.5551	33%	3	-	-	-	-
1.5	25%	0.4525	100%	2	-	-	-	-
1.0	-5%	0.7229	40%	5	-	-	-	-
0.5	-	-	-	-	-	-	-	-
Overall	1%	0.6308	50%	139	7%	0.2025	63%	32

TABLE 4.10 - Regression Analysis of Realized Bids for Successful Auctions

This table presents the results from an ordinary least squares analysis of the influence of auctions' characteristics on final realized bids for the sub-sample of successful auctions, that is those that resulted in a transaction. The final realized bids are transformed as the logarithm of Price as follows:

$$\text{LnPx} = \text{Ln}(\text{Price})$$

The regressors include an intercept, dummy variables to reflect the presence of either a secret reserve price (Res), certification (CGC), a warranty (War), a scanned image (Scan), payment by credit card (CC), the book (DB1-DB29) and its grade (D10-D98) and dummy variables to account for the difference in auction length (D5d, D7d and D10d for auctions lasting 5, 7 and 10 days respectively). Also, I include two variables that reflect reputation: LnPos and LnNeg where LnPos represents reputation and LnNeg the reputation quality.

	Coefficient	p - value		Coefficient	p - value
Intercept	2.835	0.000	DB1	2.927	0.000
CGC	0.424	0.000	DB2	2.628	0.000
Res	0.073	0.000	DB3	1.328	0.000
LnPos	0.013	0.009	DB4	0.445	0.000
LnNeg	-0.010	0.294	DB5	0.880	0.000
War	0.034	0.087	DB6	-0.832	0.000
Scan	0.133	0.002	DB7	-1.325	0.000
CC	0.015	0.343	DB8	1.038	0.000
D5d	-0.073	0.024	DB9	0.572	0.000
D7d	-0.027	0.279	DB10	-1.205	0.000
D10d	-0.007	0.803	DB11	-1.003	0.000
DFr	0.408	0.000	DB12	0.823	0.000
DFr/G	0.624	0.000	DB13	-1.967	0.000
DG-	0.672	0.000	DB14	2.380	0.000
DG	0.978	0.000	DB15	0.841	0.000
DG+	1.082	0.000	DB16	1.961	0.000
DG/VG	1.197	0.000	DB17	0.390	0.000
DVG-	1.240	0.000	DB18	-0.721	0.000
DVG	1.413	0.000	DB19	-1.597	0.000
DVG+	1.482	0.000	DB20	2.692	0.000
DVG/FN	1.637	0.000	DB21	-0.625	0.000
DFN-	1.813	0.000	DB22	-1.593	0.000
DFN	1.900	0.000	DB23	-0.573	0.000
DFN+	2.040	0.000	DB24	-1.761	0.000
DFN/VF	2.176	0.000	DB25	1.357	0.000
DVF-	2.340	0.000	DB26	1.158	0.000
DVF	2.527	0.000	DB27	1.875	0.000
DVF+	2.812	0.000	DB28	0.544	0.000
DVF/NM	3.099	0.000	DB29	-1.515	0.000
DNM-	3.408	0.000			
DNM	3.843	0.000			
DNM+	4.269	0.000			
DNM/M	4.828	0.000			

F - Stat	690.45	p-value	0.0001
R ²	0.9479	N	2377

**TABLE 4.11 - Regression Analysis of Realized Bids for Successful Auctions
with Interactive Independent Variables**

This table presents the results from two ordinary least squares analyses of the influence of auctions characteristics on final realized bids for the sub-sample of successful auctions, that is those that resulted in a transaction. The first analysis concentrates on the sub-sample of sold certified comic books while the second analysis focuses on the sold non-certified sub-sample. The final realized bid are transformed as the logarithm of Price as follows:

$$\text{LnPx} = \text{Ln}(\text{Price})$$

The regressors in each case include an intercept, dummy variables to reflect the presence of either a secret reserve price (Res), certification (CGC), a warranty (War), a scanned image (Scan), payment by credit card (CC) the book (DB1-DB29) and its grade (D10-D98) and dummy variables to account for the difference in auction length (D5d, D7d and D10d for auctions lasting 5, 7 and 10 days respectively). Also, I include two variables that reflect reputation: LnRep and LnNeg where LnRep represents reputation and LnNeg the reputation quality. In addition, we introduce five new independent variables to account for the interaction of the certification with reputation, warranty, the presence of the picture and the payment policy with a credit card.

	Coefficient	p - value		Coefficient	p - value
Intercept	2.825	0.000	DB1	2.929	0.000
CGC	0.480	0.000	DB2	2.628	0.000
Res	0.072	0.000	DB3	1.328	0.000
LnPos	0.012	0.031	DB4	0.446	0.000
LnPos * CGC	0.006	0.618	DB5	0.882	0.000
LnNeg	-0.017	0.141	DB6	-0.831	0.000
LnNeg * CGC	0.021	0.327	DB7	-1.324	0.000
War	0.039	0.074	DB8	1.037	0.000
War * CGC	-0.023	0.625	DB9	0.574	0.000
Scan	0.150	0.002	DB10	-1.204	0.000
Scan * CGC	-0.087	0.411	DB11	-1.002	0.000
CC	0.017	0.343	DB12	0.823	0.000
CC * CGC	-0.009	0.808	DB13	-1.967	0.000
D5d	-0.073	0.023	DB14	2.380	0.000
D7d	-0.027	0.286	DB15	0.841	0.000
D10d	-0.007	0.796	DB16	1.958	0.000
DFr	0.406	0.000	DB17	0.385	0.000
DFr/G	0.624	0.000	DB18	-0.721	0.000
DG-	0.672	0.000	DB19	-1.598	0.000
DG	0.978	0.000	DB20	2.687	0.000
DG+	1.082	0.000	DB21	-0.625	0.000
DGVG	1.197	0.000	DB22	-1.593	0.000
DVG-	1.240	0.000	DB23	-0.573	0.000
DVG	1.413	0.000	DB24	-1.761	0.000
DVG+	1.481	0.000	DB25	1.357	0.000
DVG/FN	1.637	0.000	DB26	1.155	0.000
DFN-	1.812	0.000	DB27	1.877	0.000
DFN	1.900	0.000	DB28	0.543	0.000
DFN+	2.040	0.000	DB29	-1.518	0.000
DFN/VF	2.175	0.000			
DVF-	2.337	0.000			
DVF	2.527	0.000			
DVF+	2.807	0.000			
DVF/NM	3.096	0.000			
DNM-	3.406	0.000			
DNM	3.840	0.000			
DNM+	4.272	0.000			
DNM/M	4.824	0.000			
F - Stat	637.69	p-value	0.0001		
R ²	0.948	N	2377		

TABLE 4.12 - Tobit Analysis of Realized Bids for All Auctions

This table presents the results from a Tobit analysis of the influence of auctions' characteristics on final realized bids. The final realized bids are transformed as the logarithm of Final Bid:

$$y_i = \ln(\text{Final Bid})$$

and the data is censored as follows:

$$\begin{cases} y_i = X_i\beta + \varepsilon_i, & \text{if } y_i > \tau_i \\ y_i = \tau_i, & \text{if } y_i \leq \tau_i \end{cases}$$

where X_i is the vector of independent variables described below and τ_i equals the minimum bid for the auction. The regressors include an intercept, dummy variables to reflect the presence of either a secret reserve price (Res), certification (CGC), a warranty (War), a scanned image (Scan), payment by credit card (CC), the book (DB1-DB29) and its grade (D10-D98) and dummy variables to account for the difference in auction length (D5d, D7d and D10d for auctions lasting 5, 7 and 10 days respectively). Also, I include two variables that reflect reputation: LnRep and LnNeg where LnRep represents reputation and LnNeg the reputation quality.

	Coefficient	p - value		Coefficient	p - value
Intercept	2.828	0.000	DB1	2.978	0.000
CGC	0.457	0.000	DB2	2.828	0.000
Res	-0.007	0.637	DB3	1.346	0.000
LnRep	0.009	0.044	DB4	0.506	0.000
LnNeg	-0.016	0.049	DB5	0.914	0.000
War	0.025	0.173	DB6	-0.776	0.000
Scan	0.164	0.000	DB7	-1.286	0.000
CC	0.019	0.202	DB8	1.067	0.000
D5d	-0.061	0.043	DB9	0.614	0.000
D7d	-0.050	0.041	DB10	-1.198	0.000
D10d	-0.017	0.527	DB11	-0.980	0.000
DFr	0.384	0.000	DB12	0.861	0.000
DFr/G	0.574	0.000	DB13	-1.955	0.000
DG-	0.643	0.000	DB14	2.433	0.000
DG	0.929	0.000	DB15	0.922	0.000
DG+	1.017	0.000	DB16	1.988	0.000
DG/VG	1.141	0.000	DB17	0.437	0.000
DVG-	1.167	0.000	DB18	-0.724	0.000
DVG	1.357	0.000	DB19	-1.546	0.000
DVG+	1.412	0.000	DB20	2.876	0.000
DVG/FN	1.559	0.000	DB21	-0.643	0.000
DFN-	1.733	0.000	DB22	-1.644	0.000
DFN	1.831	0.000	DB23	-0.566	0.000
DFN+	1.923	0.000	DB24	-1.717	0.000
DFN/VF	2.090	0.000	DB25	1.458	0.000
DVF-	2.286	0.000	DB26	1.081	0.000
DVF	2.409	0.000	DB27	1.886	0.000
DVF+	2.742	0.000	DB28	0.510	0.000
DVF/NM	3.050	0.000	DB29	-1.477	0.000
DNM-	3.339	0.000			
DNM	3.806	0.000			
DNM+	4.229	0.000			
DNM/M	4.912	0.000			

TABLE 4.13 - Analysis of the Certification Decision

This table presents results associated with concerns about the certification decision.

In Panel A, using the Overstreet Comic Book Price Guide's value for each book in Good, Fine and Near Mint and the premium received from certification for comic books respectively in grades below Very Good, between Very Good and Very Fine, and over Very Fine, we compute the premium sellers should expect from certifying the comic book. If the expected premium exceeds the minimum cost to certification, we code the Certify decision with a 1 and with a 0 otherwise.

In Panel B, we answer a parallel question. For each level of service, i.e., level of certification cost and for the same three grades, we compute the minimum Price Guide value that would justify certification. We divide the certification cost by the certification premium for each of the three grades to obtain the threshold Price Guide above which sellers should undertake certification.

Panel A - 2001 Price Guide Value and Certification Decision for Comic Books in the Sample						
Name	G	Certify	FN	Certify	NM	Certify
Amazing Fantasy 15	\$ 1,167	1	\$ 3,500	1	\$ 35,000	1
Amazing Spiderman 1	\$ 800	1	\$ 2,400	1	\$ 25,000	1
Amazing Spiderman 2	\$ 238	1	\$ 712	1	\$ 3,800	1
Amazing Spiderman 5	\$ 132	0	\$ 396	1	\$ 1,850	1
Amazing Spiderman 14	\$ 150	0	\$ 450	1	\$ 2,100	1
Amazing Spiderman 19	\$ 33	0	\$ 100	1	\$ 400	1
Amazing Spiderman 41	\$ 23	0	\$ 68	1	\$ 250	1
Avengers 1	\$ 214	1	\$ 642	1	\$ 3,200	1
Avengers 4	\$ 143	0	\$ 429	1	\$ 2,000	1
Avengers 11	\$ 21	0	\$ 61	1	\$ 225	1
Captain America 100	\$ 33	0	\$ 100	1	\$ 400	1
Daredevil 1	\$ 154	0	\$ 462	1	\$ 2,300	1
Doctor Strange 169	\$ 15	0	\$ 44	1	\$ 160	1
Fantastic Four 1	\$ 800	1	\$ 2,400	1	\$ 24,000	1
Fantastic Four 3	\$ 180	0	\$ 540	1	\$ 2,700	1
Fantastic Four 48	\$ 75	0	\$ 225	1	\$ 1,050	1
Incredible Hulk 1	\$ 600	1	\$ 1,800	1	\$ 15,000	1
Incredible Hulk 6	\$ 154	0	\$ 462	1	\$ 2,300	1
Iron Man and Sub-Manner 1	\$ 14	0	\$ 40	0	\$ 150	1
Iron Man 1	\$ 40	0	\$ 120	1	\$ 475	1
Showcase 4	\$ 1,150	1	\$ 3,450	1	\$ 32,000	1
Silver Surfer 1	\$ 41	0	\$ 123	1	\$ 625	1
Silver Surfer 2	\$ 19	0	\$ 57	1	\$ 210	1
Silver Surfer 4	\$ 40	0	\$ 120	1	\$ 480	1
Sub-Manner 1	\$ 15	0	\$ 44	1	\$ 160	1
Tales of Suspense 39	\$ 310	0	\$ 930	1	\$ 5,200	1
The Brave and the Bold 28	\$ 353	0	\$ 1,060	1	\$ 6,000	1
X-Men 1	\$ 559	1	\$ 1,675	1	\$ 9,500	1
X-Men 2	\$ 143	0	\$ 429	1	\$ 2,000	1
X-Men 16	\$ 15	0	\$ 44	1	\$ 160	1
	Certify	8	Certify	29	Certify	30

Panel B - Price Guide Minimum per Grade and Service Level warranting Certification

Service Level			Cut-off Value					
			G		FN		NM	
Economy	\$ 250	\$ 16	\$ 208	\$ 42	\$ 20			
Standard	\$ 1,000	\$ 28	\$ 364	\$ 74	\$ 35			
Express	\$ 5,000	\$ 44	\$ 572	\$ 116	\$ 55			
Waik Thru	\$ -	\$ 75	\$ 975	\$ 197	\$ 94			

TABLE 4.14 - Analysis of the Accuracy of the Price Guide

This table presents results associated with concerns about the Price Guide accuracy.

In Panel A, we compare the actual selling prices of all 30 comic books in our sample to their Price Guide value. We compute the ratio of the actual sales price to the Price Guide value for comic books in Good, Fine and Near Mint. We report the ratio's average, the result of a t-test of difference of this ratio from 1, the percentage of time the ratio is less than 1 and the result of a test of difference of this percentage from 50%, the number of observations, the percentage of comic books that were certified and finally, in the last column, the relative valuation in the Price Guide compared to the actual marketplace.

In Panel B, we group all comic books but break down the computation for each of the three grades and report similar statistics.

In Panel C, we repeat the analysis in Panel B but, in addition, we segregate the results by non-certified / certified comic book to check if the accuracy of the Price Guide varies by certification type.

5.2

Panel A - Comparison of Actual Prices to Price Guide Values per Comic Book

Name	Ratio to Guide	p-value	% OverValued	p-value	# Obs	% CGC	Valuation
Amazing Fantasy 15	1.08	0.623	50%	1.000	4	25%	Accurate
Amazing Spiderman 1	1.21	0.130	40%	0.555	10	50%	Accurate
Amazing Spiderman 2	0.86	0.016	78%	0.096	9	0%	Over
Amazing Spiderman 5	0.81	0.032	68%	0.138	16	25%	Over
Amazing Spiderman 14	1.04	0.508	38%	0.333	16	19%	Accurate
Amazing Spiderman 19	0.86	0.296	88%	0.000	24	13%	Accurate
Amazing Spiderman 41	0.96	0.841	69%	0.138	16	0%	Accurate
Avengers 1	0.75	0.001	76%	0.024	17	0%	Over
Avengers 4	0.71	0.000	100%	0.000	23	13%	Over
Avengers 11	1.06	0.839	75%	0.171	8	13%	Accurate
Captain America 100	0.93	0.471	63%	0.147	30	7%	Accurate
Daredevil 1	0.91	0.267	71%	0.090	17	12%	Accurate
Doctor Strange 100	0.95	0.806	75%	0.041	16	19%	Accurate
Fantastic Four 1	0.79	0.003	100%	0.000	7	29%	Over
Fantastic Four 3	0.76	0.023	100%	0.000	4	25%	Over
Fantastic Four 48	0.98	0.855	76%	0.003	29	28%	Accurate
Incredible Hulk 1	0.77	0.027	100%	0.000	5	0%	Over
Incredible Hulk 6	0.63	0.000	92%	0.000	13	8%	Over
Iron Man and Sub-Mariner 7	1.44	0.003	23%	0.001	31	13%	Under
Iron Man 1	1.08	0.276	55%	0.609	33	30%	Accurate
Showcase 4	-	-	-	-	-	-	-
Silver Surfer 1	1.18	0.419	69%	0.138	16	31%	Accurate
Silver Surfer 2	0.86	0.317	79%	0.002	24	8%	Accurate
Silver Surfer 4	1.41	0.137	55%	0.666	20	30%	Accurate
Sub-Mariner 1	1.39	0.041	45%	0.666	20	25%	Under
Tales of Suspense 39	0.93	0.319	75%	0.391	4	25%	Accurate
The Brave and the Bold 28	0.54	-	100%	-	1	0%	-
X-Men 1	0.77	0.000	88%	0.001	16	25%	Over
X-Men 2	0.64	0.000	100%	0.000	9	0%	Over
X-Men 16	0.99	0.925	56%	0.651	18	0%	Accurate

Panel B - Comparison of Actual Prices to Price Guide Values per Grade

Grade	Ratio to Guide	p-value	% OverValued	p-value	# Obs
Good	0.90	0.000	71%	0.000	217
Fine	0.78	0.000	80%	0.000	177
Near Mint	1.90	0.000	21%	0.000	62
All	0.99	0.674	68%	0.000	456

Panel C - Comparison of Ratios of Actual Prices to Price Guide Values per Comic Book per Certification Characteristics

Grade	Non CGC			CGC		
	Ratio to Guide	%OverValued	# Obs	Ratio to Guide	%OverValued	# Obs
Good	0.89***	72%***	209	1.13	50%	8
Fine	0.72***	85%***	146	1.01	58%	31
Near Mint	1.19	52%	25	2.37***	0%***	37
All	0.85***	75%***	380	1.68***	29%***	76